

## In Situ Shear Wave Measurements for Evaluating Dynamic Soil Properties at the Bannister Federal Complex, Kansas City, Missouri

by José L. Llopis, Thomas B. Kean II



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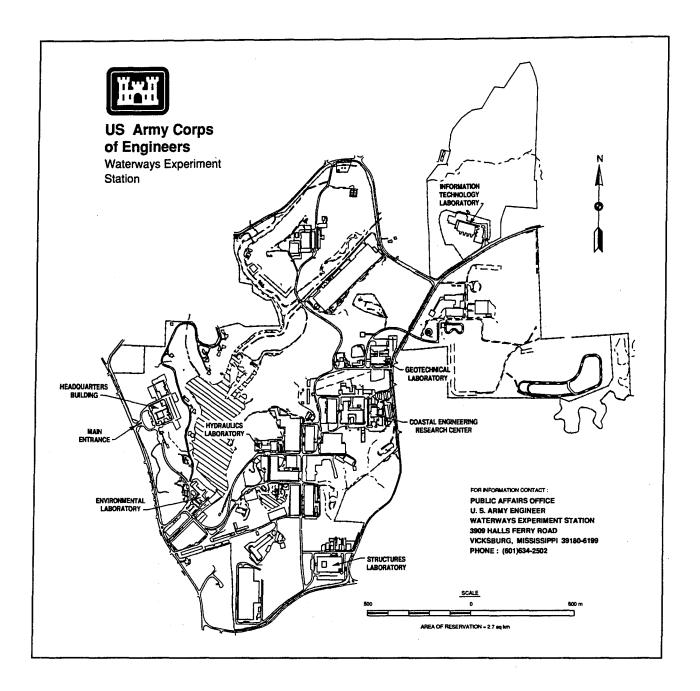
by José L. Llopis, Thomas B. Kean II

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# **Contents**

Preface iv
Conversion Factors, Non-SI to SI Units of Measurement
1-Introduction
2-Test Principles and Field Procedures
Crosshole S-wave tests
3-Test Results and Interpretation
Field and laboratory soils tests
4-Summary
References
Figures 1-27
Appendix A: Survey Results
Appendix B: Boring Logs B1
Appendix C: Laboratory Soil Test Results
Appendix D: Seismic Cone Penetrometer Test Results
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### **Preface**

A subsurface site investigation was conducted and supervised by personnel of the U.S. Army Engineer Waterways Experiment Station (WES), at the Bannister Federal Complex, Kansas City, Missouri, during the period 25 June to 1 July 1994. The work was funded under MIPR KC-94-114 dated 12 May 1994.

Mr. José L. Llopis of the Engineering Geophysics Branch (EGB), Earthquake Engineering and Geosciences Division (EEGD), Geotechnical Laboratory (GL), WES, was the project engineer. The crosshole S-wave velocity field investigation was performed by Messrs. José L. Llopis and Thomas B. Kean II, EGB. The S-wave crosshole test borings were installed by personnel of the U.S. Army Engineer District, Kansas City, (CEMRK) during 23 May to 1 June 1994. Crosshole borings and seismic cone penetrometer test (SCPT) push locations were surveyed by CEMRK personnel. Mr. Steve Jirousek was the CEMRK project geologist. The SCPT's were performed by Mr. Spencer A. Vandehey, Vandehey Soil Exploration, Banks, Oregon. Messrs. Raymond Meis and Mark Drury were the U.S. Department of Energy, Kansas City Area Office, and Allied-Signal Aerospace Corporation project managers, respectively.

The work was performed under the direct supervision of Mr. Joseph R. Curro, Jr., Chief, EGB, and under the general supervision of Drs. A. G. Franklin, Chief, EEGD, and William F. Marcuson III, Chief, GL.

At the time of publication of this report, Director of WES was Dr. Robert W. Whalin. Commander was COL Bruce K. Howard, EN.

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## Conversion Factors, Non-SI to SI Units of Measurement

Non-Si units of measurement used in this report can be converted to SI units as follows:

Multiply	Ву	To Obtain
degrees (angle)	0.01745329	radians
feet	0.3048	meters
feet per second	0.3048	meters per second
galions	3.785412	cubic decimeters
inches	2.54	centimeters
inches per second	2.54	, centimeters per second
miles (US statute)	1.609347	kilometers
pounds (force)	4.448222	newtons
tons per square foot	95.76052	kilopascals

### 1 Introduction

Current computerized seismic wave propagation analysis procedures for building foundations require that values of shear-wave (S-wave) propagation velocities as a function of depth be determined. The S-wave velocities are used in conjunction with conventional field sampling and laboratory testing to provide soil property information for a dynamic analysis of buildings and their foundations.

The Bannister Federal Complex (BFC) is located in southern Kansas City, MO, at 2000 East 95th Street, as shown in Figure 1. The BFC is a Federal facility that consists chiefly of one large main building along with an assemblage of smaller surrounding structures. The main building has approximate dimensions of 900 by 1600 ft and is occupied by the U.S. General Services Administration (GSA), the U.S. Marine Corps, and the U.S. Department of Energy (DOE). The DOE administers a manufacturing facility in the eastern portion of the main building which is operated, under contract, by the Allied-Signal Aerospace Corporation.

The DOE concerns about the potential damaging effects on manufacturing facilities and processes by seismic loadings has prompted a dynamic analysis to be initiated. At the request of the DOE the U.S. Army Engineer Waterways Experiment Station (WES) conducted a subsurface site investigation to characterize in situ S-wave velocities and other physical properties related to the foundation in the vicinity of the main building at the BFC. The information acquired from this investigation will be used in a dynamic analysis to determine the effects of seismic loadings on the main building and to aid in designing any needed structural modifications.

The WES/DOE finalized test program consisted of crosshole S-wave, seismic cone penetrometer testing (SCPT), and laboratory soil analysis which would provide the data necessary to complete an analysis of the building's response to earthquake loadings. The location of the crosshole sets and SCPT pushes are shown in Figure 2. The crosshole and SCPT push locations shown in Figure 2 are approximate locations. The surveyed crosshole and SCPT push coordinates and elevations are given in Appendix A.

The BFC is located on flood plain deposits of Indian Creek which flows easterly south of the plant. This creek joins the Blue River southeast of the plant with the resulting flow bordering the east property line. Previous studies have indicated that the site is underlain by approximately 40 ft of clay alluvium and which is also underlain by a basal clay-gravel layer. Underlying the clay-gravel layer is a shaly bedrock of the Pleasonton Group. The site is predominantly level with the exception being the bluff line on the northern portion of the site.

# 2 Test Principles and Procedures

#### **Crosshole S-wave tests**

The purpose of running crosshole tests was to determine horizontal S-wave velocities as a function of depth. An advantage of the crosshole test as opposed to surface seismic refraction test is its ability to detect low velocity layers underlying or sandwiched between layers of higher velocity. One shortcoming of the crosshole method is that boreholes are required for testing. Thus, crosshole tests seismic tests are more costly than a surface seismic refraction test. However, the crosshole technique is considered to be more definitive and accurate than the surface seismic refraction test for measuring S-wave velocities. Basically, the testing consists of measuring the arrival time of an S-wave that has traveled from a source in one borehole to a detector in another borehole(s) at the same elevation. This procedure is then repeated for the next test elevation. Knowing the distance between borings and the time the S-waves take to travel across this distance the velocity can be computed (distance divided by time).

Two crosshole sets were used for crosshole testing and their locations are shown in Figure 2. Each crosshole set consisted of three in-line borings spaced approximately 10 ft apart. Borings D-40, D-41, and D-42 which were used for the crosshole set located in the northeast parking lot were drilled to depths of approximately 52 ft, whereas borings D-43, D-44, and D-45 used for the crosshole set in the southeastern parking lot were drilled to approximate depths of 57 ft. The borings were designed to penetrate approximately 10 ft of bedrock. The crosshole borings, with a diameter of 6.25 in., were cased with a 4-in. inside diameter (ID) Schedule 40 polyvinyl chloride (PVC) casing and the bottom capped. The annular space between the casing and the walls of the boring were grouted with a material that approximated the density of the surrounding in situ material. In this case, a mixture obtained by mixing 10 lbs. of bentonite and 10 lbs. of portland cement to approximately 7.5 gal. of water was used. The cap at the bottom of the boring consisted of a one-way valve that was fitted for a tremie pipe attachment. The tremie pipe was placed through the inside of the casing and attached to the bottom check valve. Grouting was carried out in one continuous operation by pumping grout through the tremie pipe, filling the

annular space between the drilled hole and the casing, from the bottom of the borehole to the surface.

Borehole deviation (drift) surveys were conducted to determine the precise vertical alignment of each boring. Figure 3 shows the deviation probe and instrumentation used to conduct the borehole deviation surveys. The incremental borehole deviation for each elevation along with the total deviation for the boring are indicated on the control panel. Accurate reduction of data from the crosshole tests requires knowledge of the drift of each boring so that a straight-line distance between borings at each test depth can be established.

S-wave velocity measurements were obtained by placing an S-wave source in the center hole (source hole) of each crosshole set and detectors, at the same elevation, in the two outer boreholes (receiver holes). The detectors consisted of a triaxial array of geophones, or velocity transducers, (two mounted horizontally at 90 deg. to each other, and one vertically oriented) in one container. The container housing the geophones was clamped firmly to the casing wall by means of an expanding pneumatic piston. A downhole vibrator was used as a source of vertically polarized S-waves. The S-wave testing procedure consisted of lowering the vibrator in the borehole to a selected test elevation and clamping the vibrator firmly to the sidewalls of casing also with an expanding pneumatic piston. When the vibrator was in position, the operator tested a range of frequencies (50 to 250 Hz) and selected one that propagated well (one with a high amplitude) through the transmitting medium. The time required for the S-wave to travel from source to receiver hole was recorded using a portable, 24-channel seismograph with data-enhancement capability. This procedure was repeated at 5-ft depth intervals from a depth of 5 ft to the bottom of the borehole. Figure 4 illustrates the crosshole S-wave technique. An analysis of the crosshole data obtained at each test elevation was made with the aid of the computer program CROSSHOLE developed at WES (Butler, Skoglund and Landers 1978). Further information regarding geophysical testing and interpretation procedures used in this study is given in Engineer Manual EM 110-1-1802 (Department of the Army 1979).

#### Soil sampling and testing

Standard penetration tests (SPT's) were conducted at 5 ft intervals in borings D-40 and D-43, the center borings of the northeast and southeast parking lot crosshole sets, respectively. The SPT blow counts, or N-value, can be used to relate engineering behavior of soils to widely published correlations. The SPT's were conducted in strict compliance to ASTM Designation: D 1586-84. For this investigation refusal was defined as 50 blows per foot.

Soil samples were collected from borings D-40 and D-43 at 5-ft. intervals. The samples were placed in jars, sealed and sent to the U.S. Army Engineer

Missouri River Division Laboratory for further visual examination and classification. Soil tests included grain-size distribution, natural water content, Atterberg limits, and soil classification according to the Unified Soil Classification System (USCS) for each soil sample. Laboratory testing was performed between 12 and 14 July 1994. The laboratory tests were performed in accordance to procedures described in Engineer Manual EM 1110-2-1906 (Department of the Army 1970).

Field logs of each boring were prepared by the drill crew. The logs include visual classifications of the materials encountered during drilling as well as the driller's interpretation of the subsurface conditions between samples. Also recorded on the logs are the SPT blow counts and soil sample locations.

#### Seismic cone penetrometer test

The cone penetrometer test (CPT) was originally developed in Europe as a rapid and cost-effective means of determining soil stratigraphy and soil strength parameters. It is now used extensively for off-shore and on-shore geotechnical applications. The cone used for this investigation, besides having the capability to determine soil stratigraphy and soil strength parameters also allowed S-wave velocity measurements to be made.

The SCPT used for this investigation utilized a drill-rig-mounted hydraulically-powered push apparatus, to force the instrumented cone penetrometer into the soil media. The electric cone had a 60° cone tip with a 1.4-in. diameter, and included two load cells to simultaneously measure tip penetration resistance and skin, or sleeve, friction as the cone was advanced. The cone penetrometer was pushed at a rate of approximately 0.79 in/sec. Steel rods, 3.28 ft long, were used to push the cone penetrometer into the soil. Tip resistance, sleeve friction, and cone inclination measurements were taken at 0.33-ft. depth increments. A cable prethreaded through the center of the hollow push rods, connected the cone to the data acquisition system at the ground surface. Each SCPT was pushed to refusal. Because of the soil's lack of lateral support on the cone rods and concern over bending the rods refusal was arbitrarily set to a tip resistance value in excess of 100 to 125 Tsf. These measurements provide a continuous record of soil resistance to penetration which can be used to characterize the soil media in detail. The cone data can be interpreted to give a good continuous prediction of soil type and shear strength (Robertson and Campanella 1983). Full details of the design of an electronic cone are given by Campanella and Robertson, 1981.

Also embedded into the cone body is a small horizontally oriented geophone which allows S-wave velocity measurements to be taken. The downhole S-wave test was conducted by pushing the cone at an approximate rate of 0.79 in/sec to a depth of 4.59 ft and stopping further advancement. A horizontally polarized S-wave was then generated on the ground surface by striking the end of a steel beam, that was weighted down by the rear drill-rig levelling pads, with a switched sledgehammer. The geophone in the cone

body was positioned so that its axis was oriented parallel to the long axis of the steel beam (signal source) in order to detect the horizontal component of the shear wave arrival. The time the S-wave took to travel from the ground surface to the cone was measured and recorded. The cone was then pushed 3.28 ft. using the previous push rate, stopped and another S-wave measurement taken. This procedure was repeated at 3.28-ft intervals until refusal was encountered. The downhole S-wave technique is illustrated in Figure 5.

The S-wave arrival times for each test increment were plotted versus distance from the S-wave source (slant distance) as shown in Figure 6. Best fit straight line segments were then drawn through the plotted points. The slopes of the line segments correspond to the S-wave velocity for that particular depth range.

The cone was pushed at thirteen locations around the facility and their approximate locations are shown in Figure 2. The surveyed SCPT push locations and elevations are given in Appendix A. The SCPT push locations were selected to provide representative S-wave and stratigraphic information of the site. SCPT push locations 1 and 5 were located adjacent to the crosshole sets in the northeast and southeast lots, respectively. The purpose for these two pushes was to compare the downhole and crosshole derived S-wave velocities.

The SCPT is used to determine the velocity of horizontally polarized S-waves propagating vertically through the soil whereas, the crosshole test is used to determine the velocity of vertically polarized S-waves propagating horizontally through the soil. The combined use of these two methods may be used to determine the presence of possible velocity anisotropy. Velocity anisotropy many times can be measured in materials where the S-wave signal has to cross discontinuities such as bedding and fracture planes. For example consider a material that contains numerous beds whose thicknesses are thin relative to the distance between crosshole borings. In this case it would be expected that the downhole-measured S-wave velocities would be less than those measured using the crosshole method.

# 3 Test Results and Interpretation

#### Field and laboratory soils tests

The logs of the six boreholes drilled for the two crosshole tests are presented in Appendix B. The logs for the northeast parking lot, borings D-40, D-41, and D-42, show very similar results and indicate a silty lean clay from the near surface to a depth of approximately of 40 ft where a basal clay-gravel layer approximately 1 to 5 ft thick is encountered. The basal clay-gravel layer consists of fine to coarse, semi-rounded to angular limestone gravel in a clay matrix. Beneath the clay gravel at an average depth of 42 ft is the Pleasonton Group bedrock. The bedrock as described in the boring logs is soft to moderately hard shaly siltstone with a greenish-gray to light brown color.

The logs for the southeast parking lot (borings D-43, D-44, and D-45) indicate the same general stratigraphy as that recorded for the northeast lot with the exception being that the basal clay gravel layer and top of bedrock were encountered at approximate depths of 44 and 46 ft, respectively.

The boring logs indicate that in general, the N-values for the silty clays encountered at a depth of 5 ft had values ranging between 15 and 17 blows/ft and decreased to values ranging between 4 and 8 blows/ft below a depth of 10 ft. One anomalously high N-value of 18 blows/ft at a depth of 30 ft in boring D-40 is noted.

Summary tables of the soil laboratory analysis results for the northeast and southeast parking lots are given in Tables 1 and 2, respectively. Detailed laboratory results including grain size curves are presented in Appendix C. Most of the soil samples tested were classified either as a lean or sandy clay, CL, according to the USCS. Samples S-1 and S-6, obtained from boring D-40 (northeast lot), were classified as fat clay, CH, while sample S-8 was visually classified as clayey sandy gravel.

Table 1 Summa	ו ary of Labo	ratory So	ils T	estin	81 - B	oring C	Table 1 Summary of Laboratory Soils Testing - Boring D-40 - Northeast Parking Lot	east Parkin	ig Lot	
Sample	Depth, ft	Nat W%	7	PL	<u>r</u>		% Retained on #200	% Passing #200 Sieve	· Blow Count	Classification
S-1	5.0-6.5	25.0	54	16	38	0.24	6.6	93.4	17	Very dark gray fat clay, CH
S-2	10.0-10.9	31.5	48	16	32	0.48	7.2	92.8	4	Dark gray and dark brown sandy clay, CL
S-3	15.0-16.5	29.0	43	18	25	0.44	8.2	91.8	<b>∞</b>	Dark brown sandy clay, CL
S-4	20.0-21.5	30.6	39	15	24	0.65	7.8	92.2	4	Very dark gray lean clay, CL
S-5	25.0-26.4	31.5	40	18	22	0.61	7.7	92.3	מו	Very dark gray lean clay, CL
S-6	30.0-31.5	26.6	53	19	34	0.22	5.8	94.2	18	Mottled gray and rust fat clay with some sand, CH
S-7	35.0-36.5	24.6	41	16	25	0.34	25.5	74.5	<b>&amp;</b>	Mottled gray and rust sandy clay, CL
8-S	40.0-40.3		30	15	15					Dark brown clayey sandy gravel
										Note: Specimen too small for 4-point Atterberg.

LL - Liquid Limit PL - Plastic Limit Pl - Plasticity Index I<sub>L</sub> - Liquidity Index

Note: Field measured blow counts

Table 2 Summa	Table 2 Summary of Labora	ratory So	ils Te	estin	g - B	oring [	tory Soils Testing - Boring D-43 - Southeast Parking Lot	east Parkir	ng Lot	
Sample	Depth, ft	Nat W%	1	PL	Ы	L.	% Retained on #200 Sieve	% Passing #200 Sieve	* Blow Count	Classification
S-1	5.0-6.5	26.0	45	17	28	0.32	7.3	92.7	15	Dark brown lean clay, CL
S-2	10.0-11.5	26.8	38	17	21	0.47	7.2	92.8	7	Dark brown lean clay, CL
S-3	15.0-16.5	26.7	38	17	21	0.46	5.9	94.1	5	Dark brown lean clay, CL
S-4	20.0-21.5	27.2	35	16	19	0.59	5.7	94.3	4	Dark brown lean clay, CL
S-5	25.0-26.3	32.3	42	18	24	09.0	4.7	95.3	5	Dark brown sandy clay, CL
8-6	30.0-31.5	34.9	42	17	25	0.72	4.2	95.8	4	Very dark gray lean clay, CL
S-7	35.0-36.3	28.5	46	17	29	0.40	8.0	92.0	5	Very dark gray lean clay, CL
8-8	40.0-41.5	30.4	41	16	25	0.58	8.2	91.8	7	Very dark gray lean clay, CL
<sub>ල</sub> -ග	45.0-45.4		33	91	17				50	Dark brown gravelly sandy clay, CL
										Note: Specimen too small for needed sieve analysis. Visual classification with atterberg limits.
S-10	~	·	26	13	13					Gray highly weathered shale. Lean clay, CL

LL - Liquid Limit PL - Plastic Limit PI - Plasticity Index I<sub>t</sub> - Liquidity Index

Note: Field measured blow counts

#### Crosshole S-wave tests

The plotted results from program CROSSHOLE for the S-wave tests conducted in the crosshole sets located in the northeast and southeast parking lots are presented in Figures 7 and 8, respectively. The S-wave velocities and depth to interfaces agree very well for the two S-wave tests conducted in the northeast parking lot boring set. The velocities for the materials between depths of 5 and 37 ft ranged between approximately 400 and 725 fps and correspond to the clay soils. Between approximate depths of 37 and 41 ft a velocity of 1900 fps is indicated. This velocity corresponds to the depth at which a clay gravel material is indicated in the boring logs however, because of the likelihood of a refracted arrival caused by the proximity of the bedrock surface, it is likely that this velocity corresponds to a signal travelling both through bedrock and the clay gravel. The bedrock in this area had a velocity of approximately 2050 fps.

The velocities for the clay materials found between depths of 5 and 44 ft in the southeast parking lot borings ranged between approximately 500 and 725 fps. Bedrock in this area had a velocity of approximately 1750 fps which is approximately 300 fps slower than the bedrock velocity measured at the northeast parking lot. The 1750 fps bedrock velocity measured at the southeast lot may correspond to perhaps a softer or slightly more weathered bedrock than found at the northeast lot.

The S-wave data for both crosshole sets is presented in Figure 9. The figure illustrates the close velocity agreement of the clayey materials between both crosshole sets. The figure also indicates that the depth to bedrock was approximately 7 ft greater in the southeast boring set than in the northeast set. An S-wave velocity profile for the alluvium and bedrock was constructed based on the crosshole results and is presented in Table 3.

Table 3 Average Crosshol	e S-wave Velocities	
Depth Range, ft	Average S-wave Velocity, fps	Material
5 to 12	475	Clay - Alluvium
12 to 21	600	Clay - Alluvium
21 to (37-46) bedrock	700	Clay - Alluvium
(37-46) to ?	1900	Shaly Siltstone - Bedrock

#### Seismic cone penetrometer tests

Complete SCPT results which include, for each push, separate plots of tip resistance, sleeve friction, friction ratio, cone inclination, and predicted N-value versus depth are presented in Appendix D. Also, presented for each push, are tabulated values of tip resistance, sleeve friction, friction ratio, cone inclination, and the interpreted soil type for each 3.94-in. push interval. The interpreted equivalent N-values and soil classifications were derived from the interactive computer program CPTINTR1 (Greig 1986). The interpretation methods used in CPTINTR1 for estimating equivalent N-values and the soil type are given in Robertson et al. 1983 and Robertson and Campanella 1983.

The plots of tip resistance versus depth commonly show values of less than 10 Tsf throughout the push with the exception of the upper 5 to 7 ft which at times have values in excess of 100 Tsf. Some of the pushes also indicated zones, some as thick as 5 ft, exhibiting higher tip resistance values between depths of 15 and 30 ft.

The sleeve friction versus depth plots basically exhibited the same pattern as the tip resistance plots. Recorded friction values generally showed values less than 0.25 Tsf for the majority of the push. Most of the pushes indicated higher sleeve friction values in upper 5 to 7 ft. Also, as was the case with the tip resistance plots, the sleeve friction plots also indicated zones with higher friction values between depths of 15 and 30 ft.

The plot of equivalent N-values versus depth also indicated fairly consistent values of less than 10 blows/ft throughout the SCPT push. These values agree very well with the SPT values obtained in the two crosshole borings. Again, as was previously displayed in the tip resistance and friction plots, some of the SCPT pushes exhibited higher N-values for the near surface soils and for zones, up to approximately 5 ft thick, between depths of 15 and 30 ft.

The downhole S-wave results, displayed as arrival time versus slant distance, for SCPT pushes 1 through 13 are presented in Figures 10 through 22, respectively. The interpreted downhole S-wave velocity profiles for the SCPT pushes along the east, south, west, and north side of the main building are presented in Figures 23 through 26, respectively. Each figure shows the velocity profiles corresponding to pushes collected along each side of the building. The velocities for the clay materials range between 350 and 775 fps. Two of the pushes, P-8 and P-11, appear to have partially penetrated the clay-gravel layer and the velocity for this layer is approximately 1100 fps.

Figure 27 shows a comparison of the downhole and crosshole S-wave velocities for the northeast and southeast parking lots. The results of the downhole S-waves obtained near the location of the crosshole borings agree very well with the crosshole S-waves. No evidence of any velocity anisotropy was observed i.e., vertically and horizontally propagating S-waves had similar velocities.

## 4 Summary

This report documents the results of an in situ geophysical investigation conducted in the vicinity of the main building at the Bannister Federal Complex, Kansas City, MO. The purpose of the investigation was to determine the soil and bedrock S-wave velocities of the site. The S-wave values will be used to perform a dynamic analysis of the main building and its foundation.

Laboratory tests on soil samples taken from crosshole borings indicated that the alluvial material across the site is basically a lean clay and according to the USCS a CL. Underlying the clay is a basal clay-gravel layer consisting of fine to coarse, semi-rounded to angular limestone gravel in a clay matrix. The bedrock belongs to the Pleasonton Group and is encountered at an approximate depth of 40 ft. The bedrock is described in the boring logs as a soft to moderately hard shaly siltstone with a greenish-gray to light brown color.

The SCPT was used to collect S-wave velocities, tip resistance and sleeve friction measurements at 13 locations around the main building. Tip resistance and sleeve friction measurements were used to make soil classification and N-values interpretations. The SCPT results indicated the presence of approximately 5-ft thick zones, between depths of 15 and 30 ft that showed slightly higher tip resistance and sleeve friction values. SCPT S-wave results in the alluvium indicated values which increased with depth, ranging between 350 and 775 fps. Two of the pushes, P-8 and P-11, appear to have partially penetrated the clay-gravel layer and the velocity for this layer is approximately 1100 fps.

Averaged crosshole S-wave results indicate values ranging between 475 and 700 fps for the clay materials. The S-wave velocities showed an increase with depth. The average S-wave velocity for the shally siltstone (bedrock) was 1900 fps.

There was very good agreement between the S-wave results obtained from the SCPT and crosshole tests. Based on these results, if further S-wave measurements of the alluvial materials are needed it is recommended that they be collected using the SCPT. For the alluvial soils found at this site, S-waves can be collected more economically using the SCPT rather than the crosshole method. However, if further rock velocities are needed it is recommended they be measured using the crosshole method.

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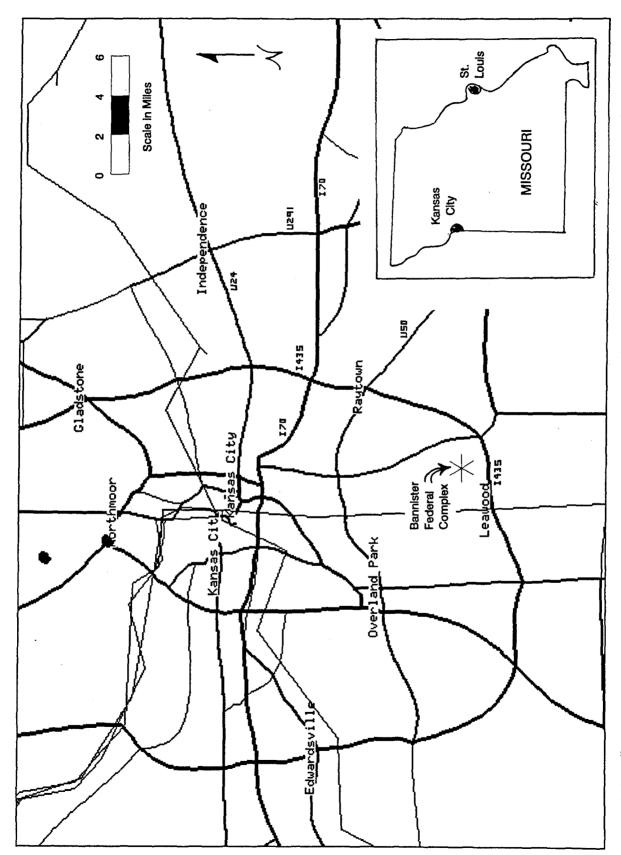


Figure 1. Locality map

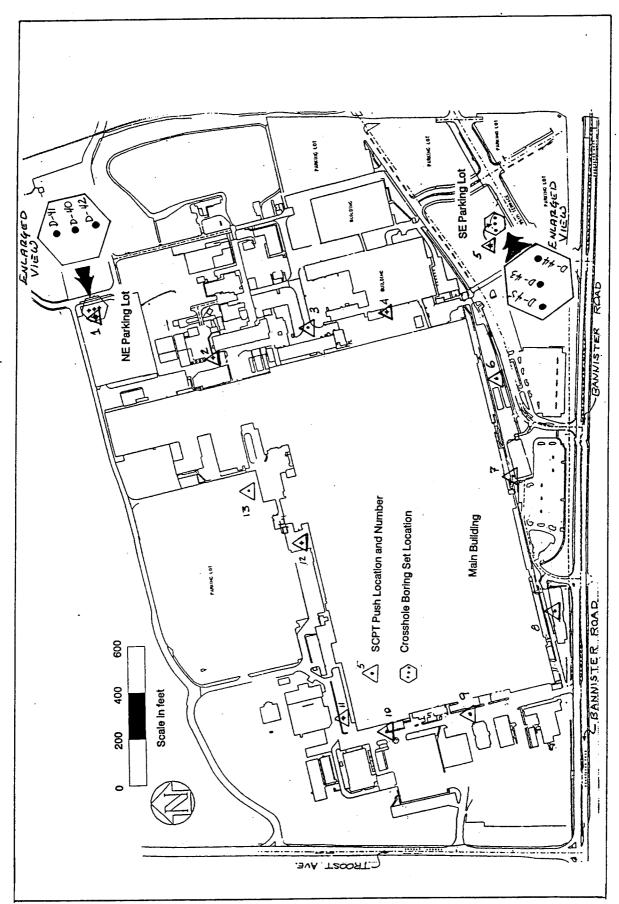
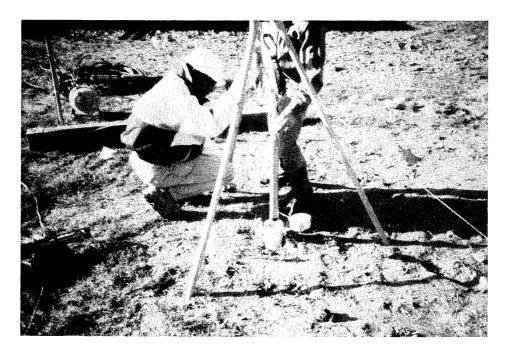
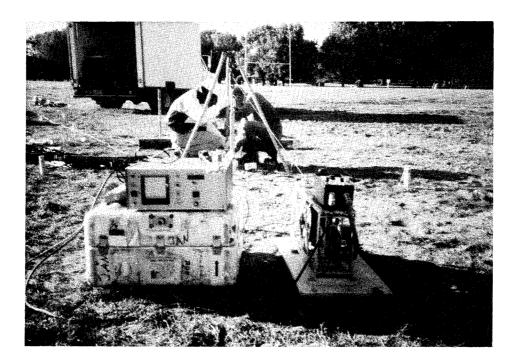


Figure 2. SCPT and crosshole boring locations



a. Deviation probe being lowered into boring



b. Surface control unit and winch

Figure 3. Borehole deviation tool

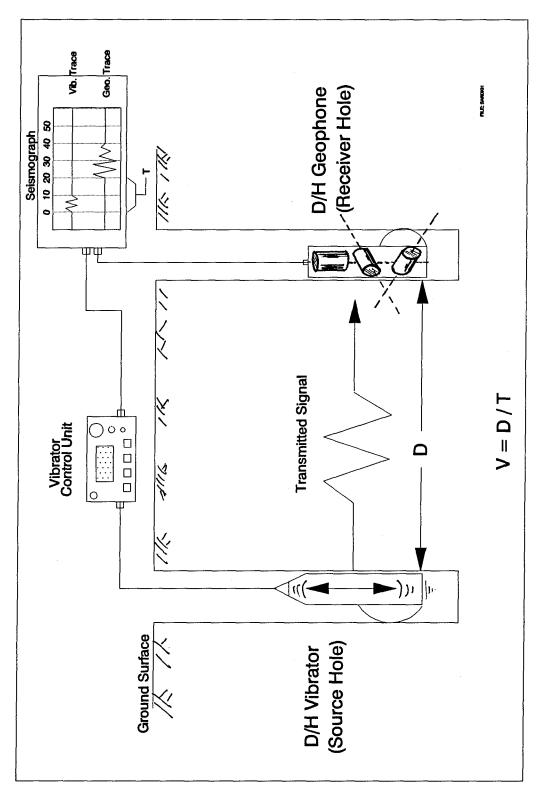


Figure 4. Crosshole S-wave testing setup

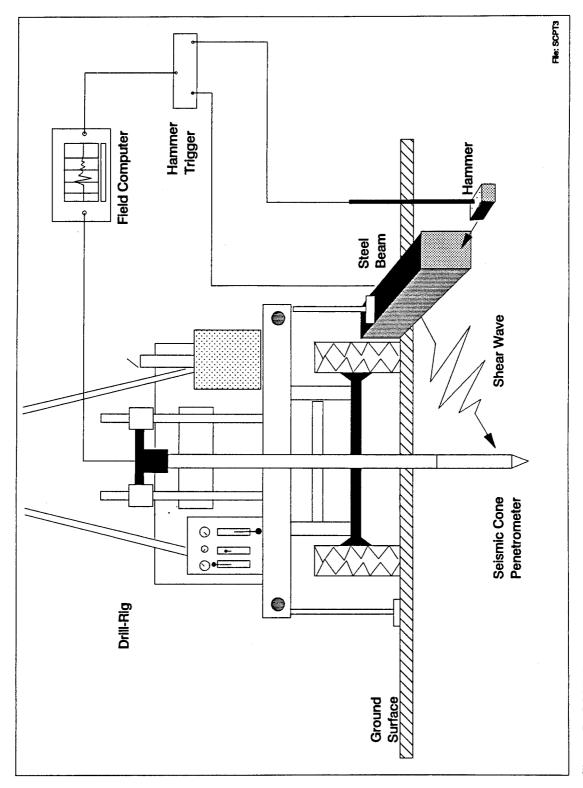


Figure 5. SCPT S-wave setup

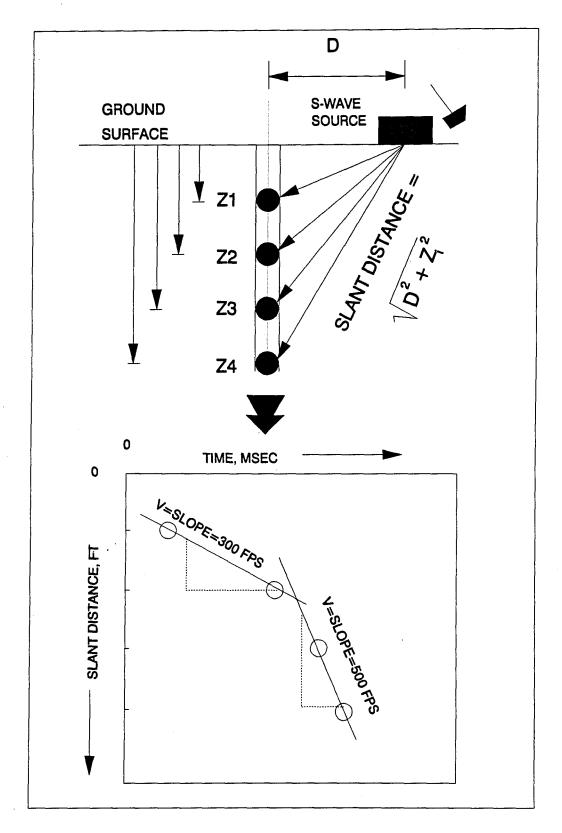


Figure 6. SCPT S-wave velocity determination

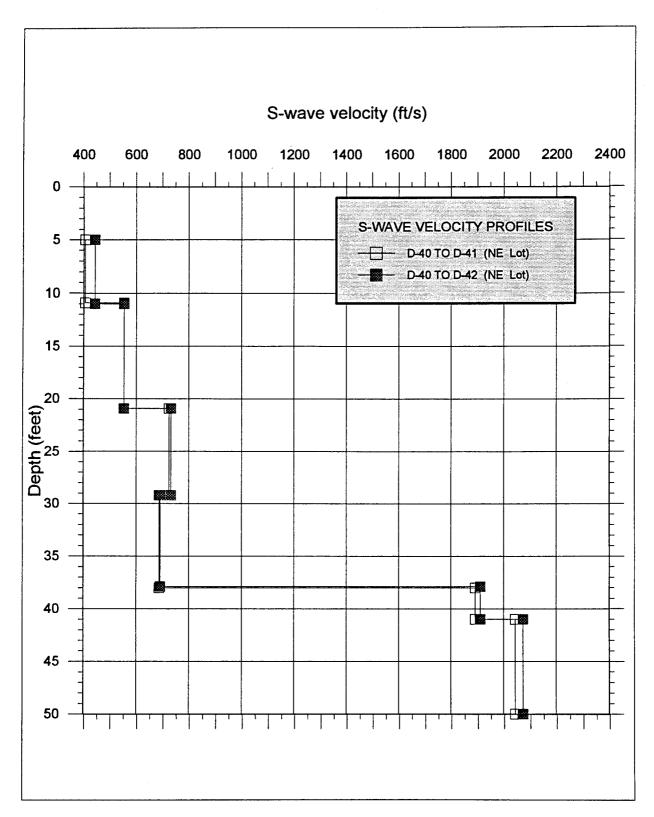


Figure 7. Crosshole S-wave results, northeast parking lot

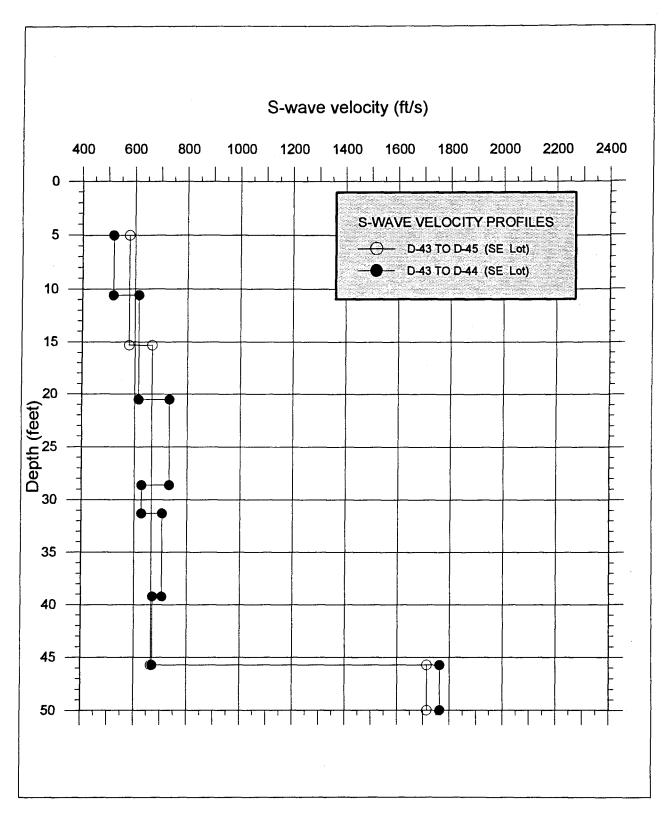


Figure 8. Crosshole S-wave results, southeast parking lot

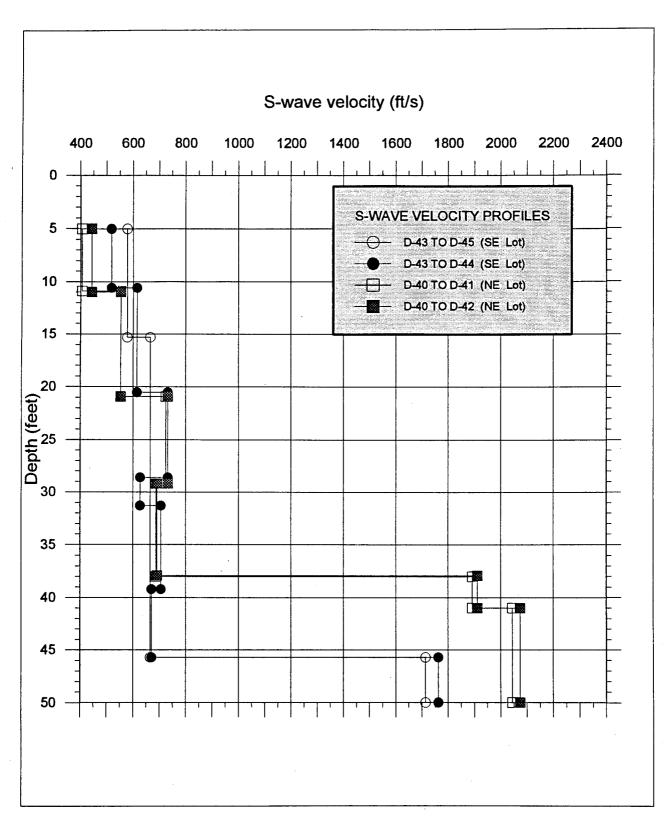


Figure 9. Superimposed crosshole S-wave results

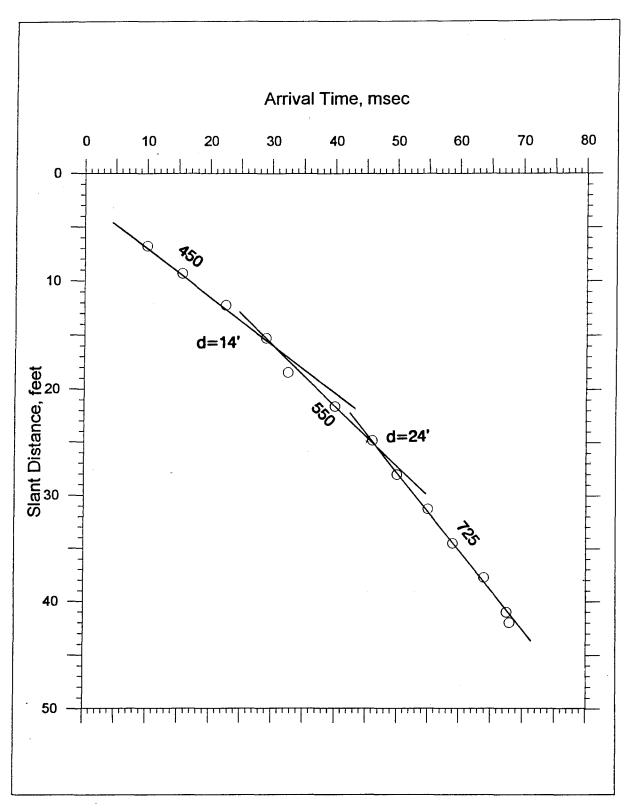


Figure 10. SCPT P-1 S-wave results

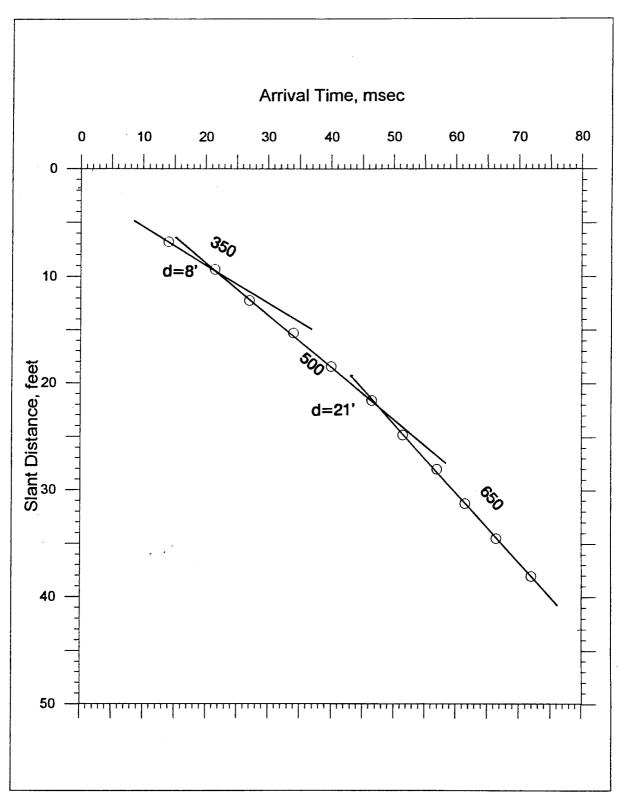


Figure 11. SCPT P-2 S-wave results

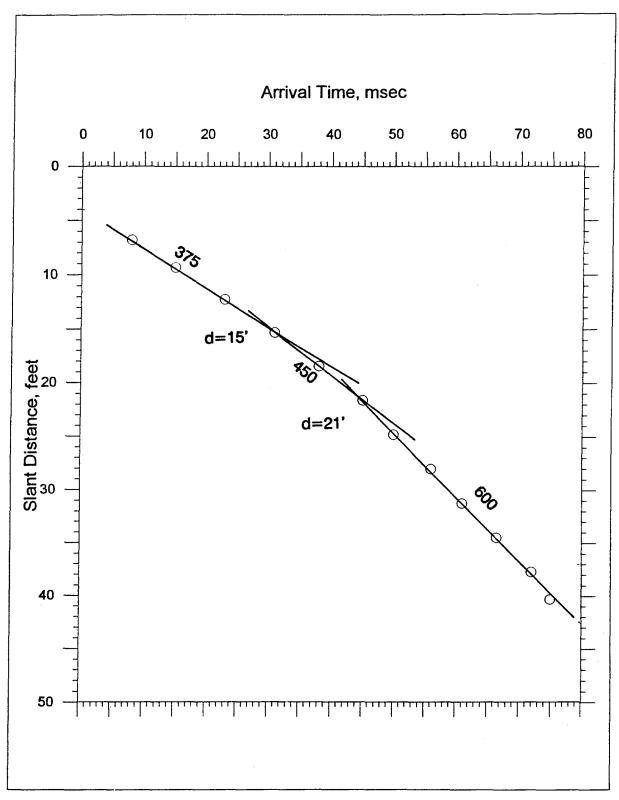


Figure 12. SCPT P-3 S-wave results

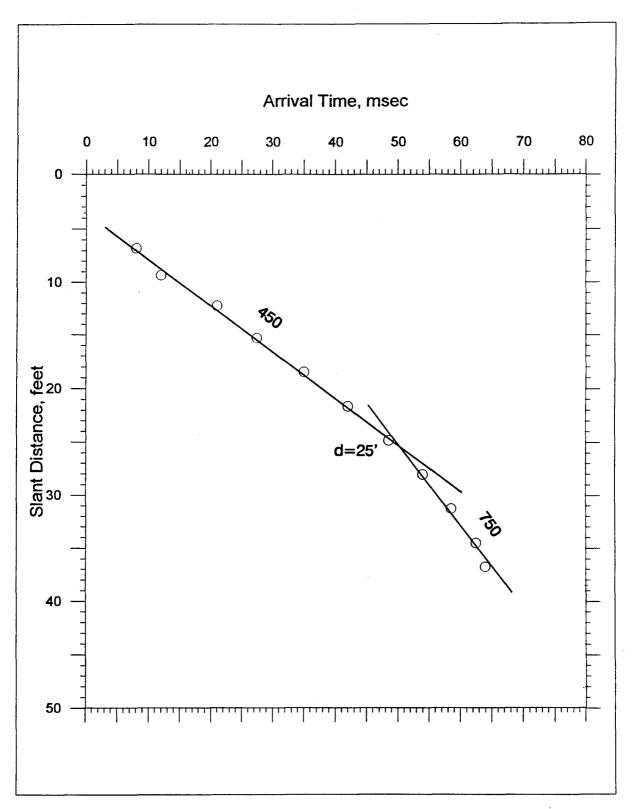


Figure 13. SCPT P-4 S-wave results

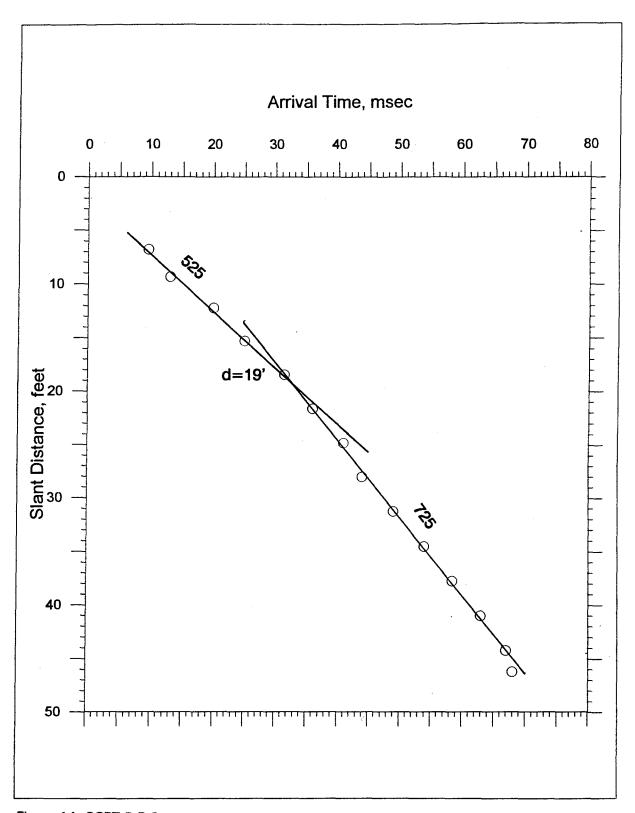


Figure 14. SCPT P-5 S-wave results

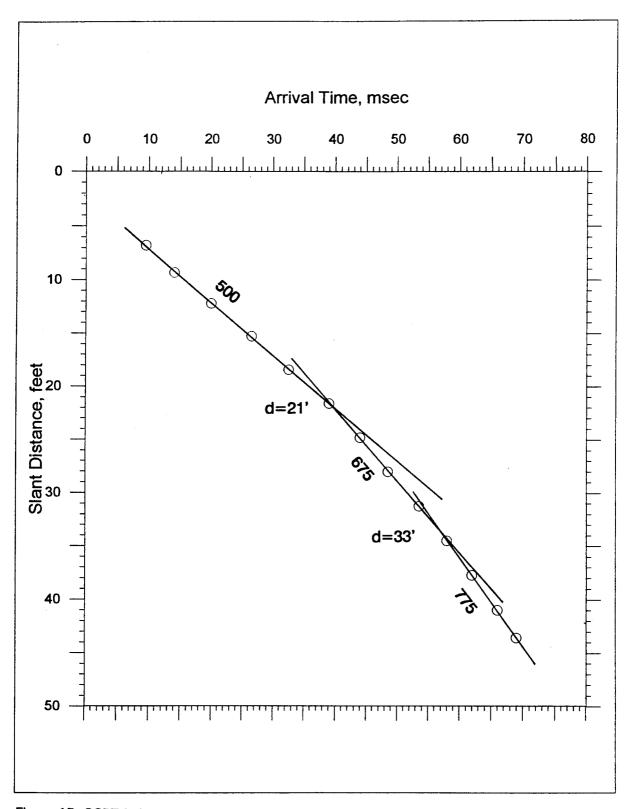


Figure 15. SCPT P-6 S-wave results

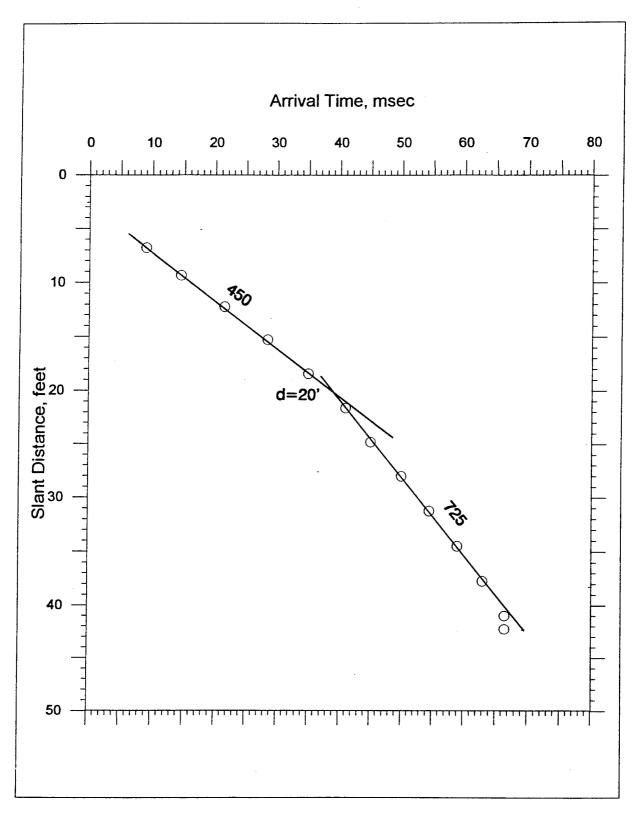


Figure 16. SCPT P-7 S-wave results

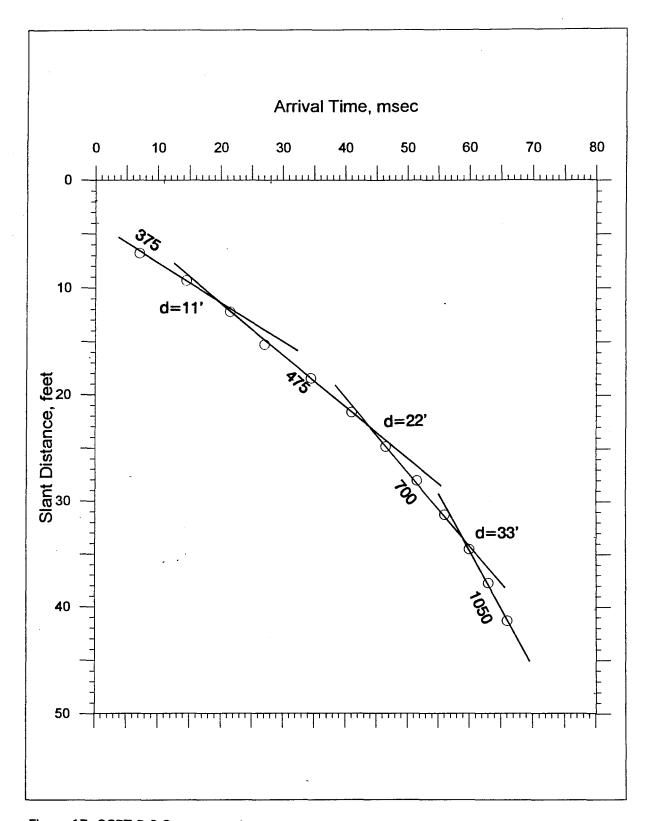


Figure 17. SCPT P-8 S-wave results

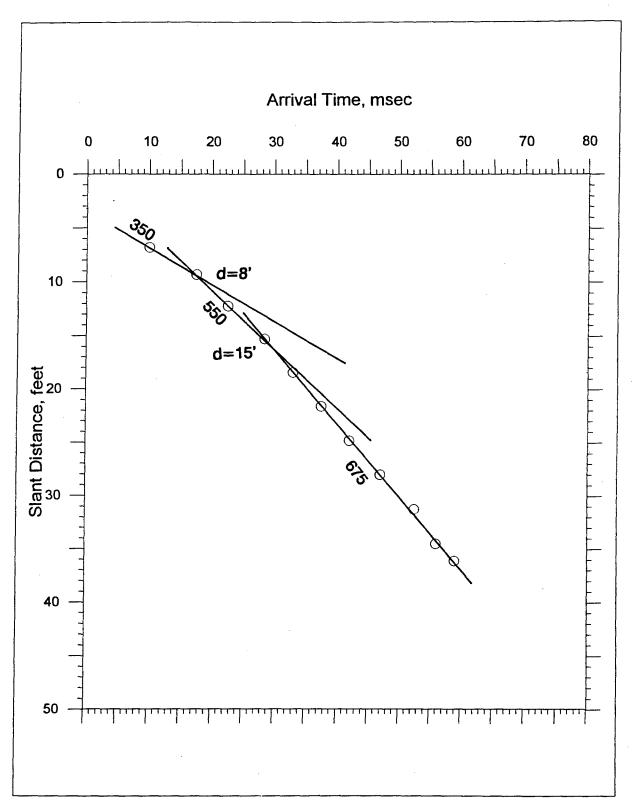


Figure 18. SCPT P-9 S-wave results

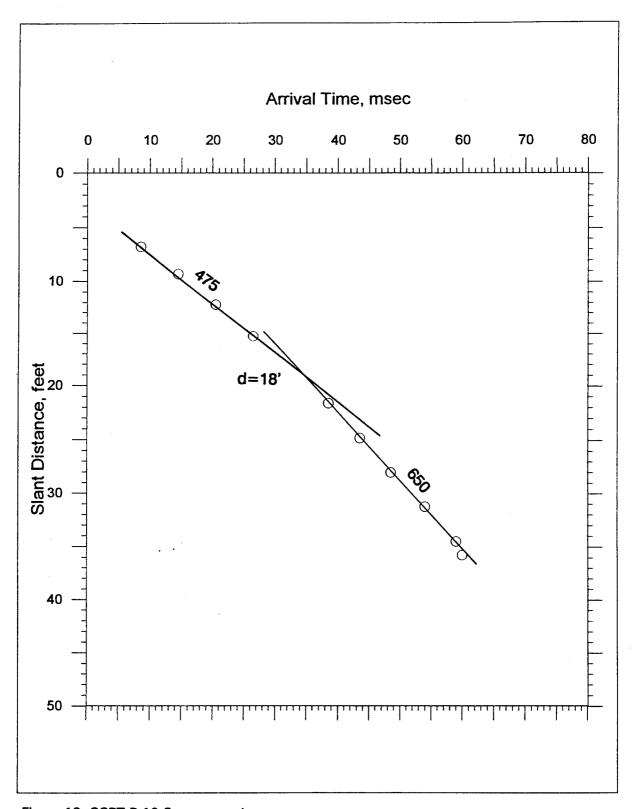


Figure 19. SCPT P-10 S-wave results

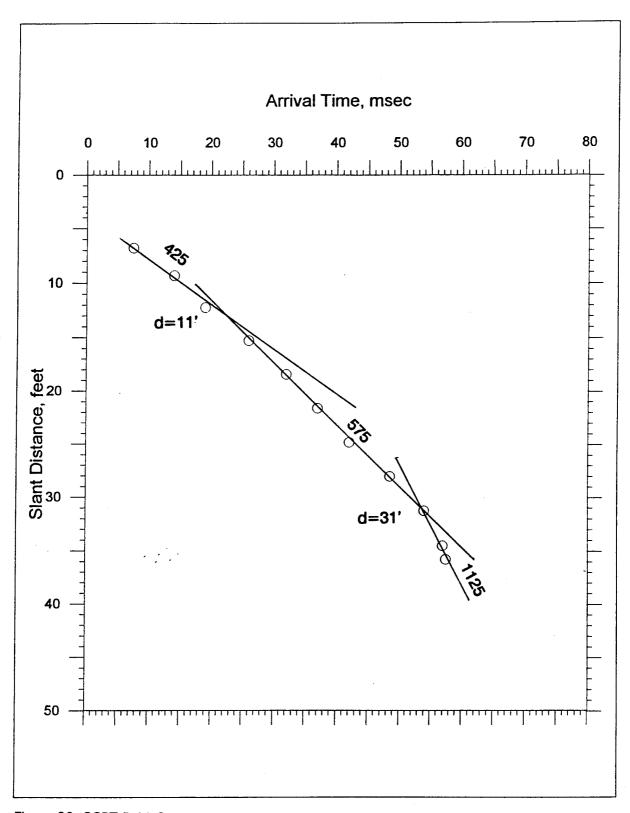


Figure 20. SCPT P-11 S-wave results

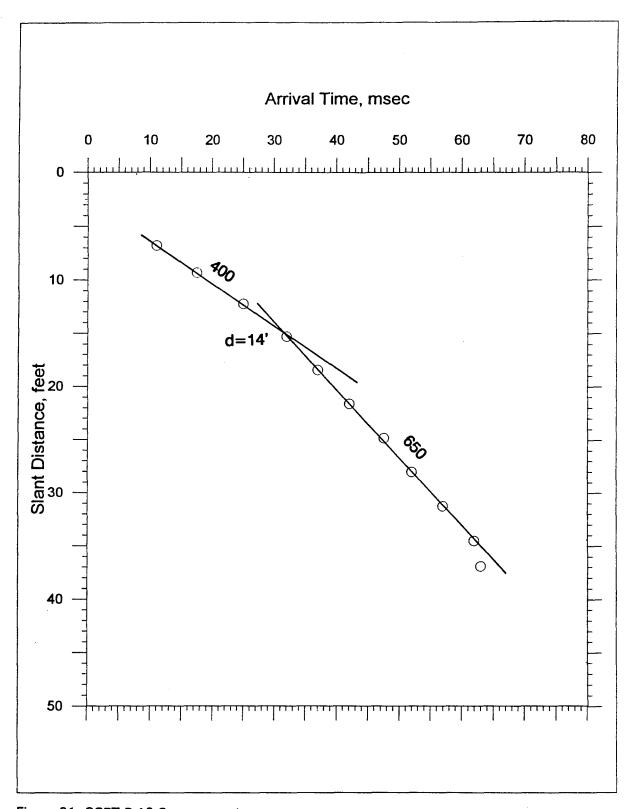


Figure 21. SCPT P-12 S-wave results

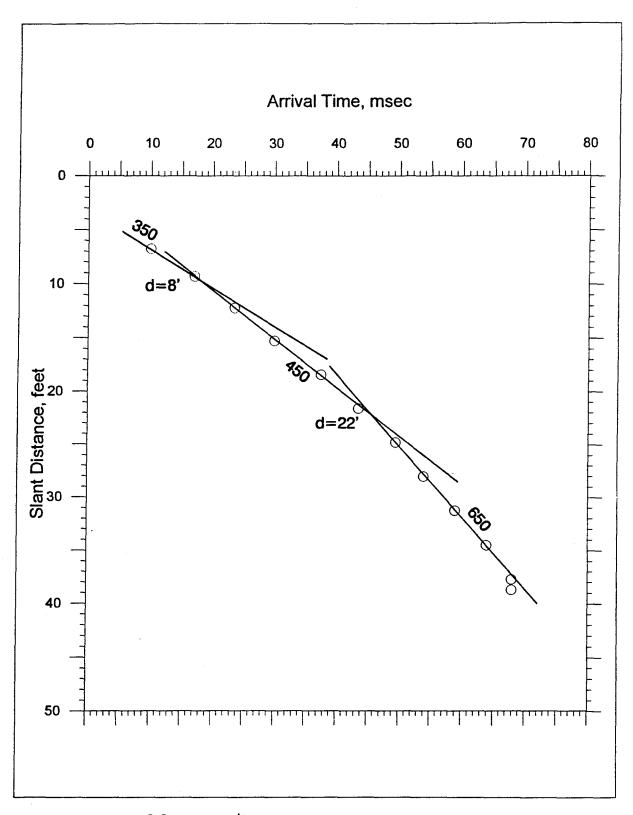


Figure 22. SCPT P-13 S-wave results

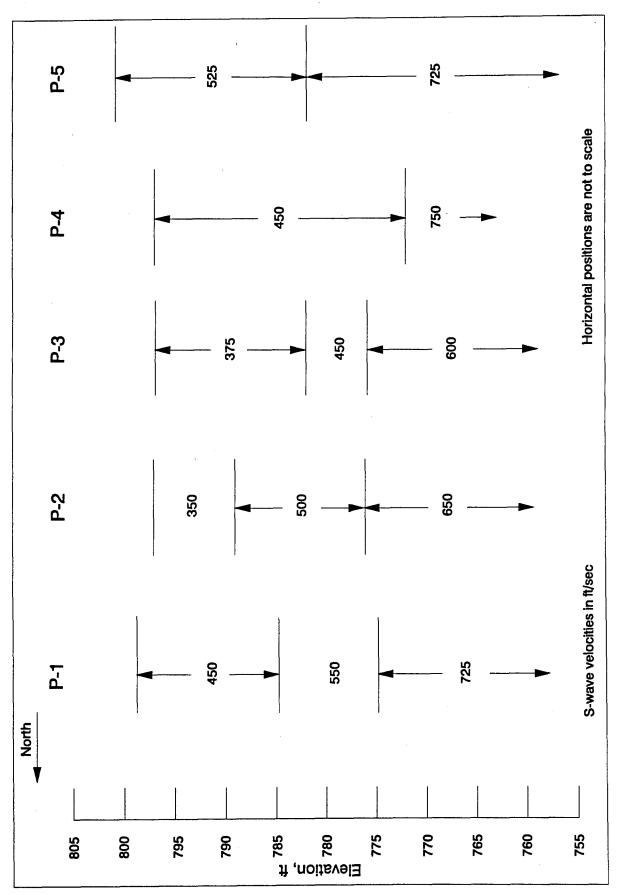


Figure 23. SCPT S-wave results, east side of main building

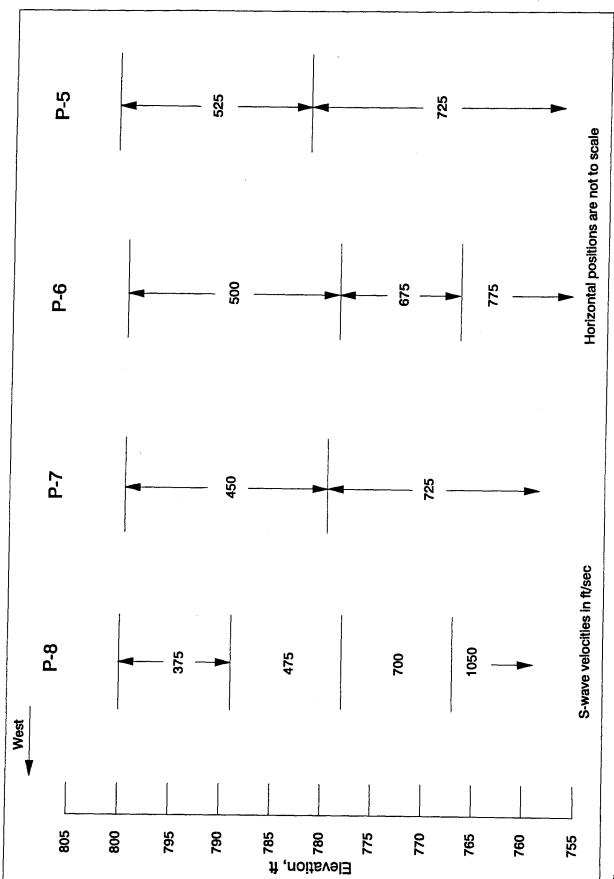


Figure 24. SCPT S-wave results, south side of main building

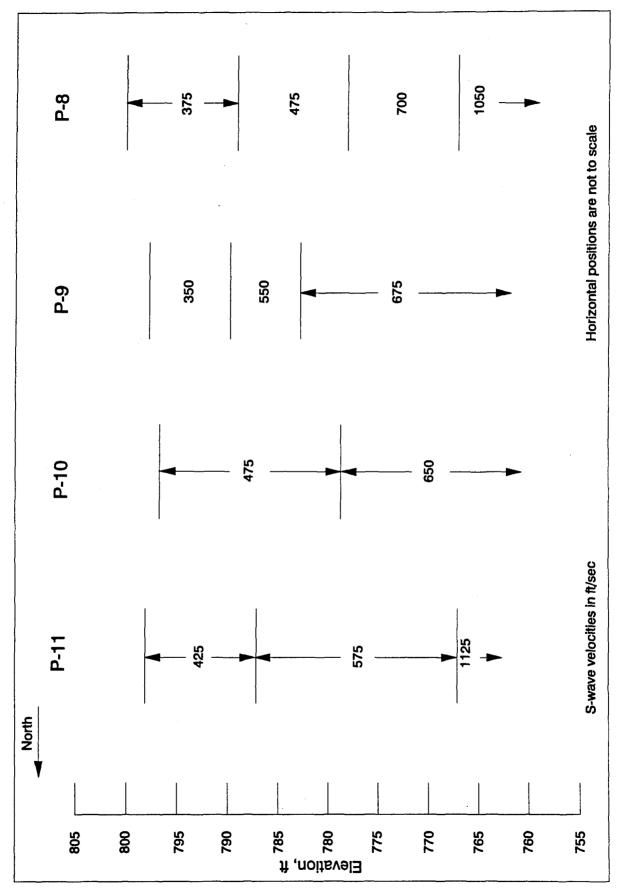


Figure 25. SCPT S-wave results, west side of main building

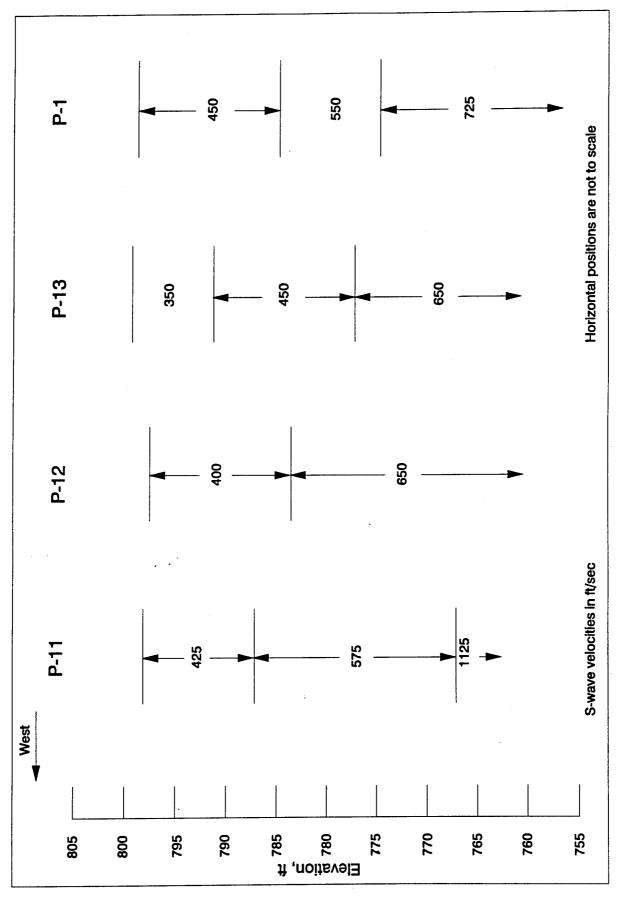


Figure 26. SCPT S-wave results, north side of main building

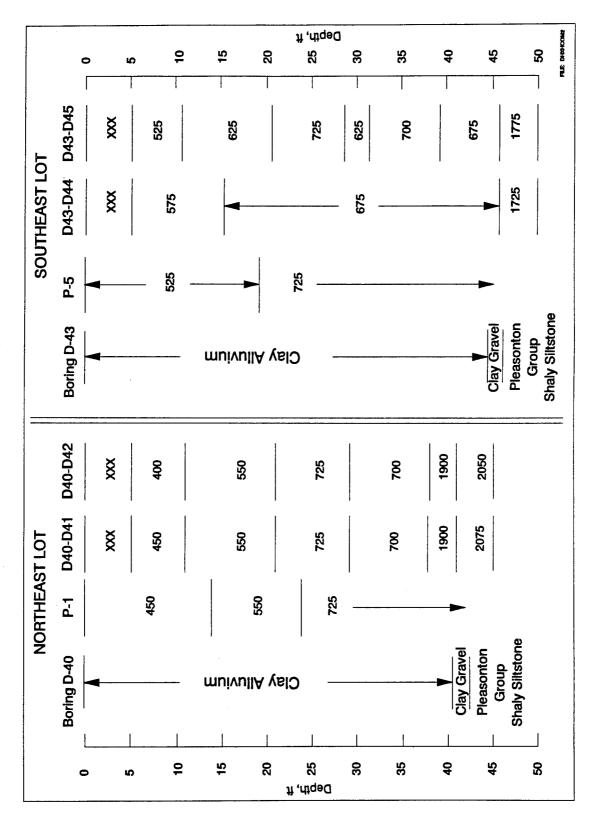


Figure 27. Crosshole and SCPT S-wave velocity profile comparisons

## Appendix A Survey Results

S-wave Crosshole Borings and SCPT Push Coordinates and Elevations									
Northing	Easting	Elevation, ft	Description						
1017812.34	2769663.61	798.74	Boring D-41						
1017802.89	2769666.03	798.79	Boring D-40						
1017792.91	2769667.71	798.84	Boring D-42						
1017806.83	2769661.52	798.69	SCPT 1						
1017184.82	2769385.27	797.09	SCPT 2						
1016673.20	2769489.31	796.89	SCPT 3						
1016207.41	2769567.16	796.82	SCPT 4						
1015560.94	2769876.10	800.64	Boring D-45						
1015563.01	2769885.64	800.75	Boring D-43						
1015565.58	2769895.69	800.85	Boring D-44						
1015566.53	2769887.41	800.79	SCPT 5						
1015710.58	2769177.31	799.59	SCPT 6						
1015644.80	2768644.24	799.69	SCPT 7						
1015472.91	2767847.79	799.98	SCPT 8						
1015937.87	2767368.18	797.64	SCPT 9						
1016386.73	2767271.46	796.62	SCPT 10						
1016634.91	2767361.29	798.07	SCPT 11						
1016834.36	2768356.42	797.59	SCPT 12						
1017111.23	2768673.77	799.16	SCPT 13						

Note: Northings and Eastings based on points #3 and #4 as shown on map by George Butler and Associates, DWG. #17810-V1 dated 2/1/93 and provided by Mr. Mark Drury, Allied-Signal Corporation. Elevations based on data stamped on brass caps.

## Appendix B Boring Logs

Boring D-41

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Northeast Parking Lot

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and realist ground Los for callings PURE 27'8" SCL 40 STIF INERA BILL HIC. Julan only D-2.7 MOIST NEBADVAR BROMNIBAGE Little and be a both reald which airlall hick sill contact 22 61/4" Ralbit 35" D.11 2-12 D"1187 10 La from Collins Gondy foul. 5.0 SILTY LEAN CLAY VERY STIFF SPT-1 3 1 /2" split spoon وبرو Triam R-15/J-1 C.O. Stommer older BROWNITH GRAY red mothing from inclusions (commandar) 5 mail amount of organic material 3..... Character Dulle 61/4" 1.- 45.1 Lugara Callins Grand, Lood 8.5 SILTY LEAD CLAY medium maist YCLLWISH BROWN occasional fine gravel ENG FORM 1836 PREVIOUS EDITIONS ARE OBSOLETE. Bannister Federal Courban Several D- 40

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D- 40 SHEET 3 OF 7 SHEETS MRO DRILLING LOG KOO to MIE AND TYPE OF BITT" HOUND SEM 14. TOTAL HUMBER CORE BOXES L DIRECTION OF HOLE MENTICAL DINCLINED 17. ELEVATION TOP OF HOLE 7. THICKNESS OF OVERBURDEN . DEPTH DRILLED MYO ROCK REMARKS CLASSIFICATION OF MATERIALS SPT - 4 (same as about) 1312 " 261:+ 26000 D-15 SILTY LEAN CLAY 2-1.5 C.O. Jewart MEDIUM 2-4 MOIST OARK GRAY Old Rope - zwraps N- Ruds Clean out w/rock bit on. fine limestine /sittstagravel 614" Rock bit Log from cuttings Gravity feed 3PT- 5 13/1" Split Spoon C.O. Stewart Old Cape - 2 waps D-12 *ک-*ت 2-14 N-Rods Chean out us rack by 61/4" Ruch Lit Log from cuttings Gravity feed much viscosity 30 sec /9t. SILTY LEAN CLAY VERY STIR MOIST BLUSH GOAT hish SIH control Bannister Federal Conglex Seismic D-40 ENG FORM 1836 PREVIOUS EDITIONS ARE OBSOLETE.

0-40 SHEET 4 KCD. DRILLING LOG ° RO 11. DATUM FOR ELEVATION ENOUGH (TEM - MEL) Johnson Complex Seems TO SECTION OF STATE O 1500 D-40 VERTIEAL ---17. ELEVATION TOP OF HOLE NA 7. THICKNESS OF OVERBURDEN L DEPTH DRILLED INTO NOCH TOTAL DEPTH OF HOLE N COME BOX OF CLASSIFICATION OF MATERIALS DEPTH LEGEN (Same As Alex) 5pt-6 13/1 Split Spoon SILTY LEANCLAY R-15 5-6 VERY STITT C.o. Stewart old Rope - 2 waps MOIST BLUISH GRAT N- Kods clean out w/rock bit high self-combod henry must sidering 644"R161 Les from Callins Garat, food
Add 105 al Hao 33,7 SILTY LEAW CLAY STIFF MOIST LEHTGRAY سرا د ۲۰۰۳ high self co cec. Surel <120 37445 SPT-7 1318" Split Spoon 2 any aust (concretion) c.o. stewart 045 K-15 5-7 old Repe - 2 waps D-Rodo clean out w/rock bit 3.7 by wat at That 64" lect bit Gland frad Los fran Cullings. Barnisher Federal Complex Science D-40 ENG FORM 1836 PREVIOUS EDITIONS ARE OBSOLETE.

D-40 Hole He. MRO DRILLING LOG KCD10. SIZE AND TYPE OF SIT O" HOLD STOM ALEQUIAL Federal Congex Finis 12. MANUFACTURER'S DESIGNATION OF BRILL TOTAL NO. OF BYETAKEN 1500 14. TOTAL HUMBER CORE BOXES COMPLETED STARTED M. DATE HOLE MALLINED 17. ELEVATION TOP OF HOLES 7. THICKNESS OF OVERBURDEN DEPTH DRILLED INTO ROCK . TOTAL DEPTH OF HOLE CLASSIFICATION OF MATERIALS DEPTH LEGENC (Jame = above) SILTY LEAN CLAY 40.3 SET-BC 13/1" CLAY GRAVEL 2-1.5 C.O. Start MEDIUM old Rope- 2waps 5 K-03 SATURATED BRAYISH BRAWN N- Rods Clean out whoch bit 3 fine to coarre grove | w/20-30% day 915 61/4" Rock Bit TOP OF BCOPACK41.9 PLEASANTON CLOUP SHALY SILTSTONE Los from outlings JUST TO MODERATELY HARD MARTING VCRY FINC GRAND
GREENS TO GRAY
micaclous
sictstone wio-20%
occ. hard Zones of bedrock as per driller, drill action, and cuttings. feed pressure 200 poil. Rig shatter PAROLECT HOLEND COMPOR Seignic D-40 ENG FORM 1836 PREVIOUS EDITIONS ARE OBSOLETE.

SHEET ( MRO DRILLING LOG 10. SAZE AND TYPE OF SITY " (TONIO) SOON ALLEGE / 6"Y MS L 1500 12 TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN 14. TOTAL NUMBER CORE BOXES IL ELEVATION GROUND WATER COMPLETED DIRECTION OF HOLE MARATICAL DIMETHE 17. ELEVATION TOP OF HOLE OA M. TOTAL CORE RECOVERY FOR BORIS . THICKHESS OF OVERSURDEN 19. SIGNATURE OF INSPECTA DEPTH DRILLED INTO ROCK CLASSIFICATION OF MATERIALS ELEVATION DEPTH 61/4" Kack Bit 9604) (same PLEAJANTON GROUP Log from cuttings SHALY SILTSTONE JOFT TO MODERATELY HARD PARTING VCKY FINE GRAID GREENIST GRAY Micacems 5:1+ stone w/10-20% sh occ. hard zenes andanhadaahaalaahaahaahaahaahaahaahaa B.O.11. 52.0' No Refuel Gw lovel undebound within drilling hother 51,8' 4" EL 40' الجداد، صعبع عمل نبر لحص solle come a solls hundowite on 1375 Has d-ymiral alianial do groud . - cosing Air Monitoring while d.: 11: 5 (0 h: 15) Jame Fe ; nglottation eliaguam ر.8م Allind Sound Cot unldes GSA Lot Power Box \*not to scale BONNITHER FEDERAL COMPLEX SOUNIES D-40 ENG FORM 1836 PREVIOUS EDITIONS ARE OBSOLETE.

Hole No. U- 10 SHEET 7 MRD DRILLING LOG KCO 10. MIZE AND TYPE OF BIT 9" LINED STORE TO PER 16"4 Food today Confor Seini MSL MANUFACTURER'S DESIGNATION OF BRILL

TO 1102 DOD

13. TOTAL NO OF OVER
BUNDEN SAMPLES TAKEN

BUNDEN SAMPLES TAKEN D:40 16. ELEVATION GROUND WATER No. + Anitable
16. DATE HOLE

5-31-94

6-21-94 Ma-1012 5-31- 94 STERTICAL OHICL 17. ELEVATION TOP OF HOLE DA 41.9 THICKNESS OF OVERBURDEN M. TOTAL CORE RECOVERY FOR BORIN . DEPTH BRILLED WTO ROCK 10.1 52.0 . TOTAL DEPTH OF HOLE REMARKS
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50% betonite great

50 lbs. cament, 50 lbs.

betonite, 37.7 gal.

Hao dry mixed then 30' P. pe Water added and mixed tremied from bottom of hole through one-way ball value. 48.8 6/4" boring diameter 51.8 Value 8.0.H. 520 CK" PROJECT Fedoral Compiler Seizel - D-40 ENG FORM 1836 PREVIOUS EDITIONS ARE

Boring D-42
Northeast Parking Lot

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Hale No. NS-42 SHEETS OFT SHEETS K C D W.R.D DRILLING LOG 10. BAZE AND TYPE OF BITG! HANGES THE SELECTION SHOWN (TEM & MELL)

11. BAYUM FOR ELEVATION SHOWN (TEM & MELL)

12. MANUFACTURER'S DEMONATION OF BRILL - 0 12. YOTAL NO. OF OVER-N5-42 14. TOTAL HUMBER CORE BOXES IL ELEVATION GROUND WATER ON A AFEL MINANE DIRECTION OF HOLE PARTICAL DINCL 17. ELEVATION TOP OF HOLE NA M. TOTAL CORE RECOVERY FOR BORING DEPTH DRILLED MITO ROCK SHATURE OF INSPECTOR . TOTAL BEPTH OF HOLE S CORE BOX OR RECOV- SAMPLE MO. CLASSIFICATION OF MATERIALS LEGEN (SANE AS ABIT) SILTY L CAN CLAY 614" Kar bb. + (con) MOST MATTING STAY MATTING STAY MATTING STAY MATTING STAY MATTING STAY SIZE POLITICALLY STAY Log from colligs SILTYLLAMEDIUM
MUST
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(right) SILTYLLAN CLAY Gone of places Ropert Robbins Rapid Halimir JILTY LEAD CLAY STILTY LEAD CLAY
VERY STIFF
MOIST GRAY
rust staining
high silt content -Add 10 gal. Hao to sump.

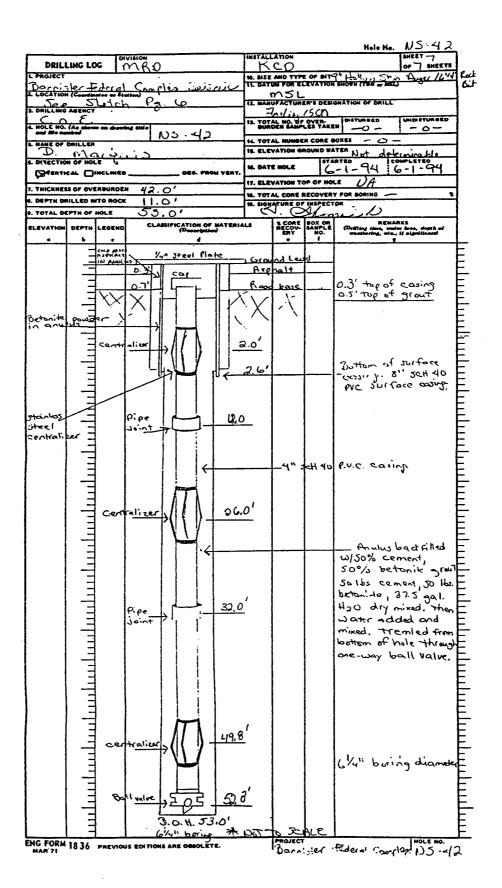
ENG FORM 18 36 PREVIOUS EDITIONS ARE OSSOLETE.

Bannister Federal Conflor N5-42

Hole No. 1)5-42
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OF 7 SHEETS LCD. 10. SIZE AND TYPE OF SITE !! IN SECURITY AND THE COLOR OF SIZE AND TYPE OF SITE !! IN SECURITY SIZE AND TYPE OF SIZE AND TYPE OF SIZE AND THE COLOR OF SIZ 12. TOTAL NO. OF OVER-BURDEN SAMPLES YAKEN NS 42 M. DATE HOLE TENTICAL DINCL 17. ELEVATION TOP OF HOLE . THICKHESS OF OVERBURDEN DEPTH DRILLED INTO ROCK TOTAL DEPTH OF HOLE ---CLASSIFICATION OF MATERIALS (Jame as above) SILTY LEAN CLAY YERY STIFF MOIST CRAY 6 14" Ruck bot Grand, frid BLUISH GRAY rust Stouring high silt content Lug Juan 10 41.33 Rapid Rotation ł moderate advance <u>33.0</u> SILTY LOAD CLAY STIFF MOITT LIGHT GRAY high sith content rust staining acc. gravel \$100 (medium) Add 10 gal. theo to rung. Danisher Federal Complex NS-42 ENG FORM 1836 PREVIOUS EDITIONS ARE OSSOLETE.

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Holo No. NS-45
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OF 7 SHEETS DRILLING LOG 10. SIZE AND TYPE OF SIT IL MANUFACTURER'S DEMONATION OF DAIL 11 TOTAL HO. OF OVER-BURDEN SAMPLES YAKEN 14. TOTAL NUMBER CORE BOXES MAME OF DRILLER IS. ELEVATION GROUND WATER TVERTICAL THELE 17. ELEVATION TOP OF HOLE . THICKHESS OF OVERBURDEN 16. TOTAL CORE RECOVERY FOR BORING DEPTH DRILLED WITO ROCK T COME SAMPLE CLAMIFICATION OF MATERIALS DEPTH LEGEN LEVATION 614" R-16,+ (out) (Same As Above) SILTY LEAD CLAY Smely Ind MEDIUM M013T rapidroblion BROWN ocr. don't bomm sools Lage cullings record ~ 23"dia. Los from cultures SILTYLEANCLAY MEDUM Soil oversland doing BROWN GRAY occ. I me muland ENG FORM 1836 PREVIOUS EDITIONS ARE OBSOLETE-Branda Indan Craylon NS 45

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VALUATION DRILLING LOG Corde IL MANUFACTORER'S BENGRATION OF BRILL IL TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN HOLE NO. (As shown on showing stell NS-45 14. TOTAL HUMBER CORE BOXES ---. THICKNESS OF OVERBURDEN DEPTH DRILLED MITO ROCK A CONT DEPTH LEGEN C 14' R 16:1 (Cod) (SAME AS ABOUE) SILTY LEAN CLAY STIH :10/57 DARKGONY Conty food Kakas Hesolat modadi photic Los from cullings Control Lew Cray
Welliam This policy
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E God Rock 450 Top of bodiet as par duillar, charge in de illatà reulliys [PIEASANTON GROUP] SHALE'Y SILTSTONE 200 p.s. pulldon SOLT IMODERATELYHADO PARTING LERY FINE GRAINED GREENGDAY occ. firesond < 10% \$ 16.00 10.00% \$ 6.00 (5mg) Shabasilfs-bassans 4 h-onghout ENG FORM 1836 PREVIOUS ENTHONS ARE O

(TRAHSLUCENT)

Bannot Fad Copler MS

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Boring D-43
Southeast Parking Lot

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L PROJECT		<del></del>					E OF BIT	9"2 / L L L MAN	1644"R-16+	]
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S. NAME OF	DRILLER		,			VATION O				┨
6. DIRECTIO	H OF HO	m.c	00	<u>o/</u>	-}			ARTED CO	MPLETED	-
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ENG FORM	192/			OHŞ ARE OBSOLETE.		PROJECT	<del>,,,,</del>	100	HOLE NO.	
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	Hole Ho. D. 43
DRILLING LOG	or 7 SHEETS
1 SPOURCE 100 STEE AND TYPE OF SIT	POST OF THE PARTY
Bannish don't Chiffy	
E LOCATION (Coordinates or Station)	ATION OF DRILL
2. DRILLING AGENCY  12. TOTAL NO. OF OVER- BURDEN SAMPLES TAKEN	DISTURBED UNDISTURBED
and the model of the same of t	<u> </u>
S. HAME OF DRILLER  14. TOTAL MUMBER CORE BOTH 15. ELEVATION GROUND WATER	
S. DIRECTION OF HOLE	
DESTICAL THELINED DES. PROM VERT.	
17. ELEVATION TOP OF MOLE 7. TIMCKHESS OF OVERBURDEM M. TOTAL CORE RECOVERY	
E. BEPTH BRILLED INTO ROCK	1
S. TOTAL DEPTH OF HOLE  CLASSIFICATION OF MATERIALS  CONT. BOX OF RECOVER SAMPLE  CLASSIFICATION OF MATERIALS  CONT. BOX OF RECOVER SAMPLE  CONT. BOX OF RECOVER	REMARKS
	(Drilling time, water leas, depth of westlesing, etc., if eignificant)
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3 SILTYLEAN CLAY	SPT-2 146 spldspar
	CC-D, Cula Jumps 3
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BEOWY molles Swy molles yould have s	
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D15	13/8" splitspoon
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ENG FORM 1836 PREVIOUS EDITIONS ARE OSCOLETE.	7 cd Contr D-43

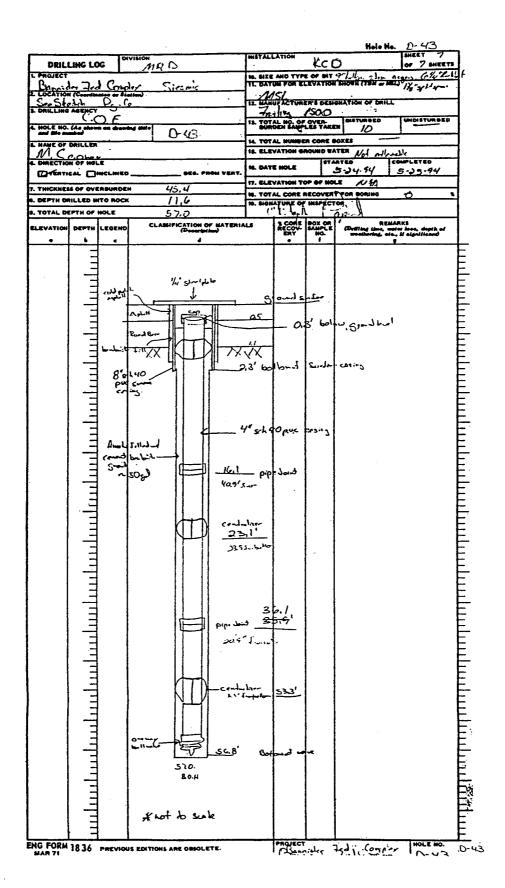
						<u> </u>	Hole He.	0-43 TSHEET 3	
DRILL	ING LO	G DIV	TISION	BUSTALLA				OF 7 SHEE	<u>m</u>
I, PROJECT		7.1	Condex	16. SIZE	MID TYPE	OF BIT	виран (там 🕳 🚾	,	7
1. LOCATION	(Coordin	100 or \$4m	- Corper	12. MAHU	FACTURE	R'S DESIG	HATION OF BRILL	<del></del>	7
2. DRILLING				12. TOTA	L NO. OF	OVER-	DISTURBED	UNDISTURBE	•
4. HOLE HO.		******	D-43		L NUMBER			1	
& NAME OF					ATION OR	OUND WA	TER	OMPLETED	-
& DIRECTION			DEG. FROM YEAT.	16. DATE					
7. THICKNES					ATION TO		FOR BORING		<u> </u>
e, DEPTH DE					TURE OF				
S. TOTAL DE			CLASSIFICATION OF MATERIA (Decembries)	41.5	1 CORE	BOX OR BAMPLE NO.	(Drilling time, we treathering, ore	RICS for Seen, depth o	
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FOF	IM 183	6 PREV	IOUS EDITIONS ARE OBSOLETE.		Ba	nnah	7-dan Coul	m 10-	4/3

		·					Hole Ho. D - 4/3	
DRIL	LING LO	xc ∣'	HOISION .	IMSTAL	LATION		OF 7 SHE	
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L LOCATIO	ú (coadh		(elen)	12. 144	UFACTUR	ER'S DES	IGNATION OF BRILL	
1. DRILLING	AGENCY							
4. HOLE HO.	(As abou		ring stella	12. TO	TAL NO. DI	OVER-		40
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S. HAME OF	DAILLER				EVATION 6			一
4. DIRECTIO	H OF HOL	.€					ARTED COMPLETED	
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7. THICKNES	11 OF OVI	70011001	TW	17. CU	EVATION T	OP OF HO	re	
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s. TOTAL DE				┦҇```	WELL &		C. I.	- 1
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Boring D-44
Southeast Parking Lot

				100.00			Hole No. NS	- 44		
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e. TOTAL D	EPTH OF	HOLE	т—						MARKS	-		
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Hole Ho. 18-44 SHEET 5 OF 7 SHEETS INSTALLATION DRILLING LOG 10. SIZE AND TYPE OF SIT 7-1 Coyler 12. MANUFACTURER'S DESIGNATION OF DRILL 13. TOTAL NO. OF OVER-HOLE HO. (As about on a NS-44 14. YOTAL HUMBER CORE BOXES NAME OF DRILLER 16. ELEVATION GROUND WATER AENAICHT DIMCTIMED 17. ELEVATION TOP OF HOLE THICKNESS OF OVERBURDEN M. TOTAL CORE RECOVERY FOR BORING M. SIGNATURE OF IMSPECTOR L DEPTH DRILLED INTO ROCK S. TOTAL DEPTH OF HOLE REMARKS
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PROJECT

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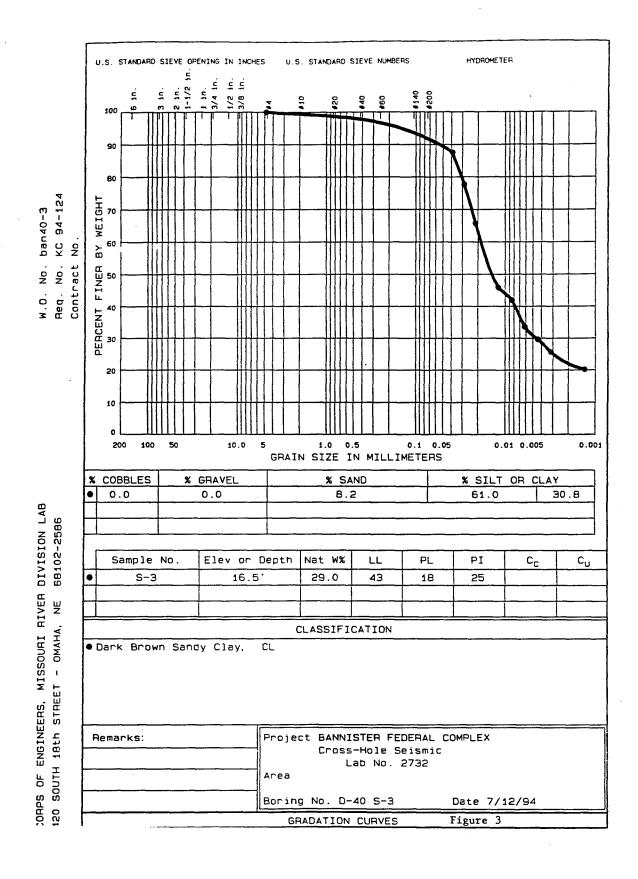
DRILLING LOG MRD 64-2-16 ed Complex Same 12 MANUTACTURER'S DESIGNATION OF CRILL Japha 1500 12 TOTAL NO. OF OVER-SUMDER SAMPLES TAKEN CHETURES NOUND WATER 528 94 5-24-14 MANAGER OMCTHE 17. ELEVATION TOP OF HOLE 7. THICKNESS OF OVERBURDEN DEPTH DRILLED INTO ROCK 1013 570 CLASSIFICATION OF MATERIALS 1474 -11--1 mibbell وسوات لتحج Rar & bate 27 MX XX ومنعه مسلسء علام "B 40. אנג י of puc cosing 20' hally - rin sus . 163' <u> 25.8'</u> Vensity Andre Silled of 50% Who to 50% ~60m 36.31 فيدسم container 152.8 568' hollo 5 Bullethe 570 BoH \* not lo sule ENG FORM 1836 PREVIOUS EDITIONS ARE OBSOLETE. Bannish Fodent Combon Deep NS-44

## **Appendix C Laboratory Soil Tests Results**

Boring D-40

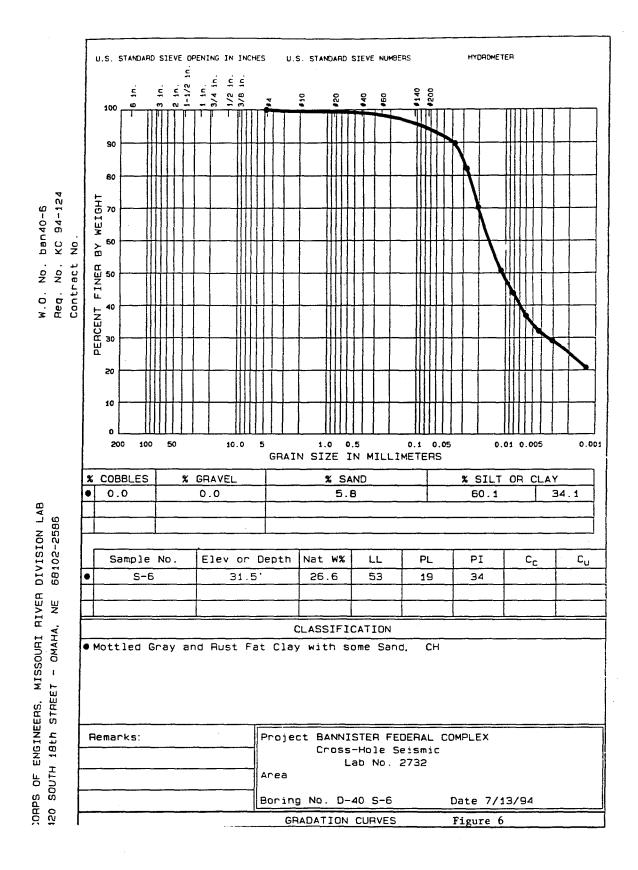
Northeast Parking Lot

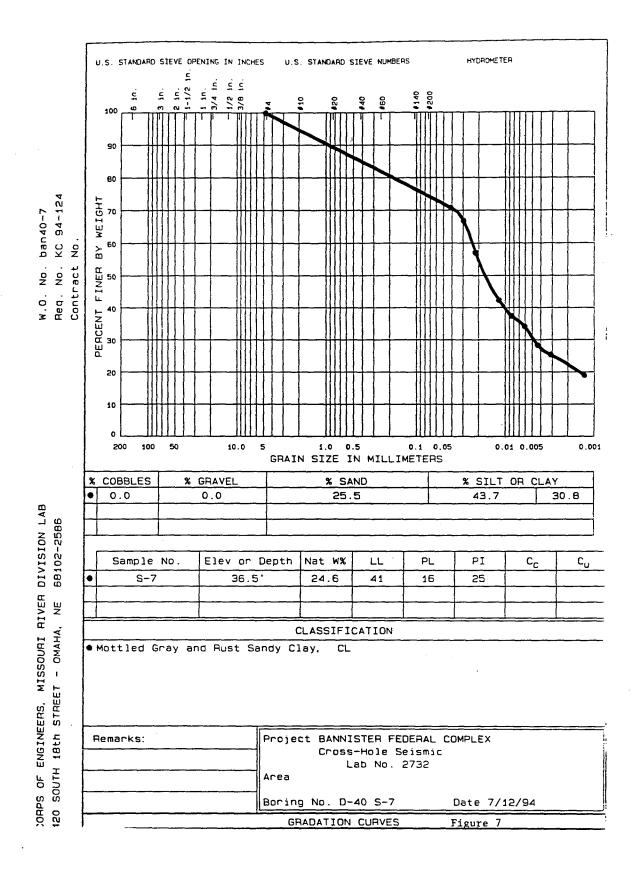
U.S. STANDARD SIEVE OPENING IN INCHES U.S. STANDARD SIEVE NUMBERS HYDROMETER 3/4 In. ₹ ₹ 3 in. 1 in. Ď. 1/2 1 420 100 80 BY WEIGHT 9 04 KC 94-124 ban40-2 W.O. No. I Req. No. I Contract I FINER 8 PERCENT 8 20 10 0 100 50 10.0 0.1 0.05 0.01 0.005 0.001 GRAIN SIZE IN MILLIMETERS % COBBLES % GRAVEL % SILT OR CLAY % SAND 0.0 0.0 7.2 57.5 35.3 CORPS OF ENGINEERS, MISSOURI RIVER DIVISION LAB 58102-2586 Sample No. Elev or Depth | Nat W% PL ΡI  $c_{u}$ LL  $C^{\mathsf{c}}$ 10.9 S-5 31.5 48 16 32 420 SOUTH 18th STREET - OMAHA, NE CLASSIFICATION ● Dark Gray and Dark Brown Sandy Clay, Remarks: Project BANNISTER FEDERAL COMPLEX Cross-Hole Seismic Lab No. 2732 Area Boring No. D-40 S-2 Date 7/12/94 GRADATION CURVES Figure 2



HYDROMETER U.S. STANDARD SIEVE OPENING IN INCHES U.S. STANDARD SIEVE NUMBERS 3/4 In. 1/2 In. 3/8 In. 5 5 **#**50 100 90 BY WEIGHT 9 04 KC 94-124 ban40-4 W.O. No. t Req. No. t Contract FINER 20 PERCENT 0 0.001 100 10.0 1.0 0.5 0.1 , 0.05 0.01 0.005 200 50 5 GRAIN SIZE IN MILLIMETERS % COBBLES % GRAVEL % SAND % SILT OR CLAY 0.0 0.0 60.6 31.6 DIVISION LAB 69102~2586 Sample No. Elev or Depth Nat W% LL PL ΡI  $c_c$  $C_{\mathbf{u}}$ S-4 21.5' 30.6 39 15 24 CORPS OF ENGINEERS, MISSOURI RIVER IZO SOUTH 18th STREET - OMAHA, NE CLASSIFICATION • Very Dark Gray Lean Clay, Project BANNISTER FEDERAL COMPLEX Remarks: Cross-Hole Seismic Lab No. 2732 Boring No. D-40 S-4 Date 7/15/94 GRADATION CURVES Figure 4

U.S. STANDARD SIEVE OPENING IN INCHES U.S. STANDARD SIEVE NUMBERS HYDROMETER 3/4 In. 1/2 in. 3/8 In. 1-1/5 #140 #200 100 90 60 KC 94-124 WEIGHT ¥ 60 Š PERCENT FINER Contract Req. No. 20 10 0.001 100 50 10.0 1.0 0.5 0.1 0.05 0.01 0.005 GRAIN SIZE IN MILLIMETERS % COBBLES % GRAVEL % SAND % SILT OR CLAY 29.1 0.0 0.0 7.7 63.2 CORPS OF ENGINEERS, MISSOURI RIVER DIVISION LAB 68102-2586 Elev or Depth | Nat W% Sample No. LL PL ΡI  $c^c$  $c_{u}$ S-5 26.4 40 31.5 18 22 420 SOUTH 18th STREET - OMAHA, NE CLASSIFICATION ● Very Dark Gray Lean Clay, Aemarks: Project BANNISTER FEDERAL COMPLEX Cross-Hole Seismic Lab No. 2732 Boring No. D-40 S-5 Date 7/12/94 GRADATION CURVES Figure 5





## LIQUID AND PLASTIC LIMITS TEST REPORT 47 45 43 41 41 42 39 37 37 35 33 31 29 5 6 7 8 9 10 12 14 16 18 20 25 30 40

Location + Description	LL	PL	ΡI	-200	ASTM D 2487-85
D-40 S-B Clayey Sandy Gravel	30	15	15		

NUMBER OF BLOWS

Project No.: 2732

Project: BANNISTER FEDERAL COMPLEX

Cross-Hole Seismic

Client: Kansas City District

Location: D-40 S-8

Remarks:

Dark Brown

Specimen too small for

4-point Atterberg

Date: 7/12/94

LIQUID AND PLASTIC LIMITS TEST REPORT

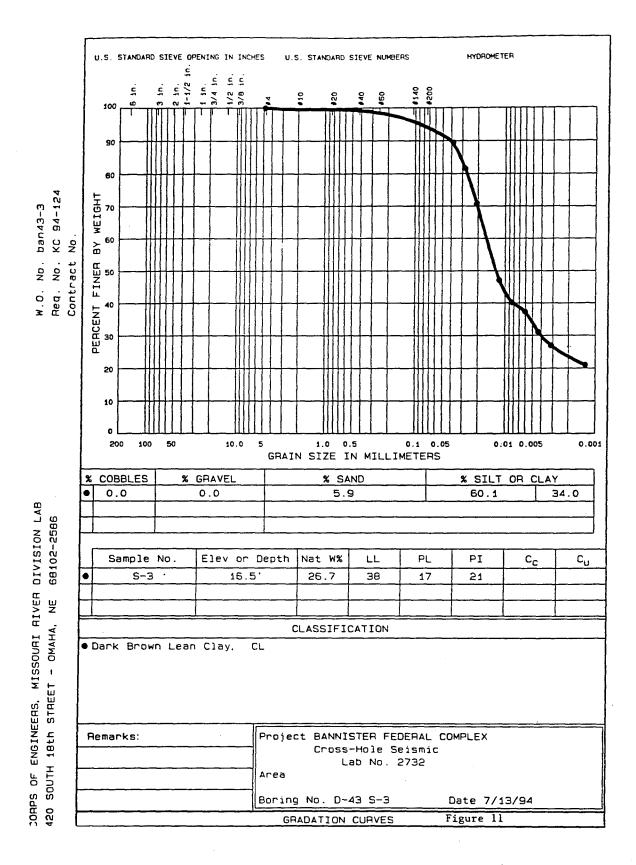
COE - MISSOURI RIVER DIV. LAB

Fig. No. 8

Boring D-43

Southeast Parking Lot

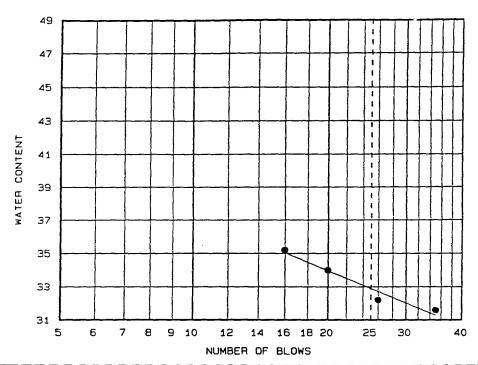
HYDROMETER U.S. STANDARD SIEVE OPENING IN INCHES U.S. STANDARD SIEVE NUMBERS 3/4 In. 1/2 In. 3/8 In. 1-1/2 3 In. #140 Ë 100 90 80 KC 94-124 No. WEIGHT W.O. No. ban43-2 Req. No. KC 94-124 Contract No. ≿ <sup>60</sup> PEACENT FINER
8 0 0 0 20 10 100 50 10.0 1.0 0.5 0.1 0.05 0.01 0.005 GRAIN SIZE IN MILLIMETERS % COBBLES % GRAVEL % SAND % SILT OR CLAY 0.0 0.0 7.2 63.5 MISSOURI RIVER DIVISION LAB 68102-2586 Sample No. Elev or Depth Nat W% LL PL ΡI  $c_c$  $c^{\mathsf{n}}$ 17 S-2 11.5 26.8 38 21 420 SOUTH 18th STREET - OMAHA, NE CLASSIFICATION ● Dark Brown Lean Clay, CORPS OF ENGINEERS, Remarks: Project BANNISTER FEDERAL COMPLEX Cross-Hole Seismic Lab No. 2732 Area Boring No. D-43 S-2 Date 7/12/94 GRADATION CURVES Figure 10



U.S. STANDARD SIEVE OPENING IN INCHES U.S. STANDARD SIEVE NUMBERS HYDROMETER 3/4 In. 1/2 In. 3/8 In. 1-1/2 1 in. Ë Ë 4200 100 80 KC 94-124 No. WEIGHT ban43-7 E 60 W.O. No. FINER 6 Contract Req. No. PERCENT S 20 10 100 50 10.0 1.0 0.5 0.1 0.05 0.01 0.005 0.001 200 5 GRAIN SIZE IN MILLIMETERS % COBBLES % GRAVEL % SAND % SILT OR CLAY 0.0 0.0 в.0 56.8 35.2 CORPS OF ENGINEERS, MISSOURI RIVER DIVISION LAB 68102-2586 Sample No. Elev or Depth Nat W% LL PL ΡI  $c^c$  $c_{u}$ S-7 36.3 28.5 17 46 29 Ä 420 SOUTH 18th STREET - OMAHA, CLASSIFICATION ● Very Dark Gray Lean Clay. Remarks: Project BANNISTER FEDERAL COMPLEX Cross-Hole Seismic Lab No. 2732 Area Boring No. D-43 S-7 Date 7/12/94 GRADATION CURVES Figure 15

U.S. STANDARD SIEVE OPENING IN INCHES HYDROMETER U.S. STANDARD SIEVE NUMBERS 1/2 in. 3/8 in. 3/4 In. 1-1/2 1 In. 2 in. 3 In. #140 #200 \$20 100 80 KC 94-124 No. WEIGHT 09 , 60 ₩ W.O. No. 1 Contract PERCENT FINER 20 10 200 100 10.0 5 1.0 0.5 0.1 0.05 0.01 0.005 0.001 GRAIN SIZE IN MILLIMETERS % COBBLES % GRAVEL % SAND % SILT OR CLAY 0.0 0.0 8.2 60.6 31.2 CORPS OF ENGINEERS, MISSOURI RIVER DIVISION LAB 68102-2586 Sample No. Elev or Depth Nat W% LL PL ΡI  $c^c$  $c_{u}$ S-8 41.5 25 30.4 41 16 120 SOUTH 18th STREET - OMAHA, NE CLASSIFICATION Very Dark Gray Lean Clay. Remarks: Project BANNISTER FEDERAL COMPLEX Cross-Hole Seismic Lab No. 2732 Area Boring No. D-43 S-ệ Date 7/13/94 GRADATION CURVES Figure 16

## LIQUID AND PLASTIC LIMITS TEST REPORT



Location + Description	LL	PL	ΡI	-200	ASTM D 2487-85
Gravelly Sandy Clay, CL	33	16	17		

Project No.: 2732

Project: BANNISTER FEDERAL COMPLEX

Cross-Hole Seismic

Client: Kansas City District

Location: D-43 S-9

Date: 7/14/94

LIQUID AND PLASTIC LIMITS TEST REPORT

COE - MISSOURI RIVER DIV. LAB

Remarks:

Dark Brown

Specimen too small for

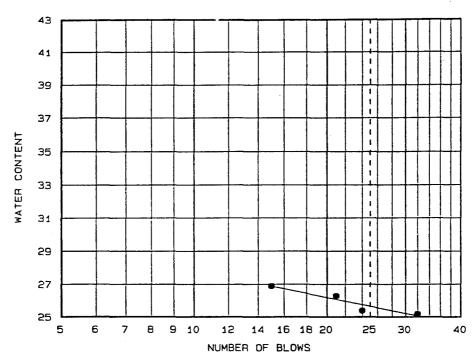
needed sieve analysis

Visual classification

with atterberg limits

Fig. No. 17

## LIQUID AND PLASTIC LIMITS TEST REPORT



	Location + Description	LL	PL	PI	-200	ASTM D 2487-85
•	D-43 S-10 Highly Weathered Shale	26	13	13	90	CL. Lean clay

Project No.: 2732

Project: BANNISTER FEDERAL COMPLEX

Cross-Hole Seismic

Client: Kansas City District

Location: D-43 S-10

Date: 7/12/94

LIQUID AND PLASTIC LIMITS TEST REPORT

COE - MISSOURI RIVER DIV. LAB

Remarks:

Gray

Fig. No. 18

## Appendix D Seismic Cone Penetrometer Test Results

SCPT P-1

Vandehey Soil Expl

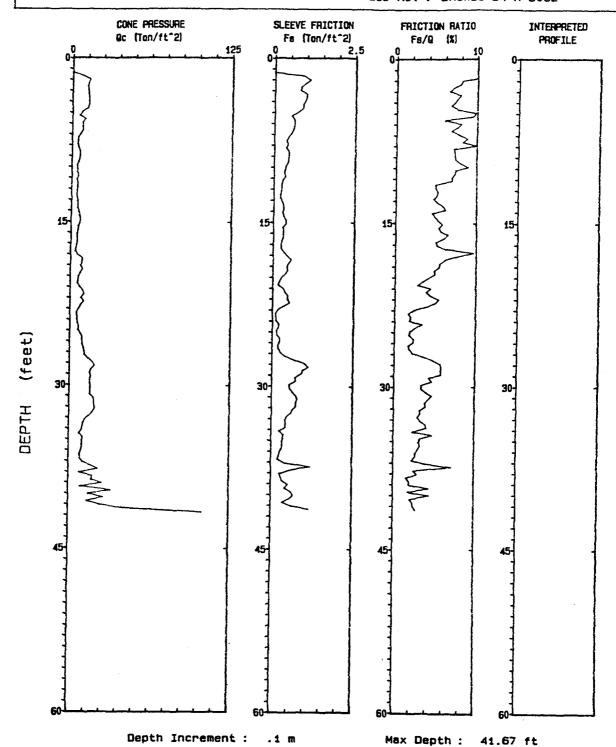
Operator : S.VAN

Sounding: SND-91 Pg 1 / 1

Client: WES

CPT Date : 06-26-94 19: 20

Location: P-1/BOC-KC MO
Job No.: DACW39-94-M-5062



SOUNDING DATA IN FILE SND-91 06-26-94 19:20

OPERATOR : S.VAN

LOCATION : P-1/BFC-KC MO

CLIENT : WES

JOB No.

: DACW39-94-M-5062

Vandehey Soil Exploration

40695 Nw Pacific Ave. Banks, Oregon. 97106 (503) 324 3261

DEPTH meters	DEPTH feet	TIP Oc tsf	FRICTION Fs tsf	FR RATIO	INC I deg	INTERPRETED SOIL TYPE
		4		7-	0	
0.10	0.3	0.0	0.000	?	1.0	
0.20	0.7	0.0	0.000	?	0.1	
0.30	1.0	0.0	0.000	?	0.1	
0.40	1.3	0.0	0.000	?	0.1	
0.50	1.€	8.2	0.905	11.04	0.1	organic material
0.50	2.0	13.6	1.093	8.08	0.1	clay
0.70		12.1	0.948	7.61	0.1	clay
0.80	2.6	11.6	0.805	6.97	0.1	clay
0.90	3.0	12.1	0.793	€.45	0.1	clay
1.00	3.3	12.5	0.992	7.91	0.1	clay
1.10	3.8	13.0	0.978	7.50	0.1	clay
1.20	3.9	13.0	0.933	7.18	0.1	clay
1.30	4.3	13.0	0.878	6.73	0.1	clay
1.40	4.6	11.6	0.876	7.57	0.1	clay
1.50	4.9	7.3	0.723	9.86	0.1	clay
1.60	5.2	5.5	0.521	9.39	0.1	clay
1.70	5.6	10.2	0.604	5.90	0.1	clay
1.80	5.9	7.9	0.631	8.01	0.1	clay
1.90	6.2	8.0	0.598	7.44	0.1	clay
2.00	8.8	8.4	0.569	€.77	0.1	clay
2.10	6.9	6.5	0.507	7.83	0.1	clay
2.20	7.2	4.9	0.431	8.85	0.1	organic material
2.30	7.5	4.5	0.374	8.26	0.1	organic material
2.40	7.9	4.1	0.413	10.03	0.1	organic material
2.50	8.2	5.0	0.354	7.09	0.0	clay
2.60	8.5	6.2	0.444	7.21	0.0	clay
2.70	8.9	6.3	0.453	7.22	0.0	clay
2.80	9.2	5.9	0.439	7.38	0.0	clay
2.90	9.5	5.3	0.428	8.02	0.0	clay
3.00	9.8	4.0	0.358	8.97	0.0	organic material
3.10	10.2	4.6	0.334	7.32	0.0	organic material
3.20	10.5	4.3	0.311	7.24	0.0	clay
3.30	10.8	5.0	0.344	6.86	0.0	clay
3.40	11.2	3.9	0.270	€.88	0.0	clay
3.50	11.5	4.9	0.235	4.80	0.0	clay
3.60	11.8	4.7	0.231	4.87	0.0	clay
3.70	12.1	4.3	0.221	5.15	0.0	clay
3.80	12.5	3.9	0.196	4.98	0.0	clay
3.90	12.8	4.2	0.193	4.63	0.0	clay
4.00	13.1	5.4	0.262	5.12	0.0	clay

Soil interpretation reference: Robertson & Campanella-1983, based on 60% hammer efficiency and .2 m sliding data average

DEPTH	DEPTH	TIP	FRICIION	FR RATIO	INC	INTERPRETED
meters		Oc tsf	Fs tsf	Fs/Qc 4	I deg	SOIL TYPE
MC CC1 S		40 001				
4.10	13.5	5.3	0.305	5.79	0.0	clay
4.20	13.8	5.1	0.310	€.08	0.0	clay
4.30	14.1	6.1	0.271	4.43	0.0	clay
4.40	14.4	€.5	0.318	4.86	0.0	clay
4.50	14.8	7.4	0.390	5.24	0.0	clay
4.60	15.1	€.9	0.399	5.74	0.0	clay
4.70	15.4	5.5	0.290	5.29	0.0	clay
4,86	15.7	5.3	0.292	5.51	0.0	clay
4.90	16.1	4.6	0.298	9.41	0.0	clay
5.00	16.4	4.9	0.288	5.87	0.0	clay
5.10	16.7	4.9	0.241	4.91	0.0	clay
5.20	17.1	4.5	0.238	5.12	0.0	clay
5.30	17.4	4.1	0.252	6.19	0.0	clay
5.40	17.7	3.5	0.342	9.70	0.0	organic material
5.50	18.0	5.8	0.446	7.64	0.0	clay
5.60	18.4	9.1	0.547	6.01	0.0	clay
5.70	18.7	8.6	0.457	5.40	0.0	clay
5.80	19.0	7.9	0.420	5.32	0.0	clay
5.90	19.4	9.6	0.453	4.73	0.0	clay
6.00	19.7	7.7	0.371	4.82	0.0	clay
6.10	20.0	6.2	0.257	4.12	0.0	clay
6.20	20.3	5.8	0.196	3.38	0.0	clay
6.30	20.7	5.5	0.154	2.78	0.0	clay
6.40	21.0	7.4	0.323	4.36	0.0	clay
6.50	21.3	9.9	0.375	3.79	0.0	clay
6.60	21.7	10.8	0.464	4.30	0.0	clay
5.70	22.0	8.4	0.448	5.34	0.0	clay
6.80	22.3	10.6	0.518	4.88	0.0	clay
6.90	22.6	8.1	0.324	4.00	0.0	clay
7.00	23.0	6.7	0.154	2.31	0.0	silty clay to clay
7.10	23,3	5.0	0.084	1.67	0.0	silty clay to clay
7.20	23.€	5.3	0.105	1.98	0.0	silty clay to clay
7.30	23.9	5.5	0.097	1.77	0.0	silty clay to clay
7.40	24.3	5.8	0.194	3.36	0.0	clay
7.50	24.6	a.a	0.159	2.39	0.0	silty clay to clay
7.60	24.9	6.5	0.121	1.88	0.0	silty clay to clay
7.70	25.3	8.2	0.146	1.77	0.0	silty clay to clay
7.80	25.€	9.9	0.232	2.34	0.0	silty clay to clay
7.90	25.9	9.7	0.218	2.24	0.0	clayey silt to silty clay
8.00	26.2	9.8	0.165	1.68	0.0	clayey silt to silty clay
8.10	26.5	10.6	0.199	1.88	0.0	clayey silt to silty clay
8.20	26.9	11.4	0.253	2.22	0.0	clayey silt to silty clay
8.30	27.2	11.7	0.412	3.51	0.6	silty clay to clay
8.40	27.6	14.4	0.674	4.68	0.0	clay
8.50	27.9	17.9	1.001	5.60	0.0	clay
8.60	28.2	19.5	1.123	5.75	0.0	clay
8.70	28.5	16.8	0.938	5.65	0.0	clay
8.90	28.9	15.7	0.902	5.76	0.0	clay
8.90	<b>29.</b> 2	16.7	0.711	4.26	0.0	clay
9.00	<b>2</b> 9.5	15.7	0.721	4.59	0.0	clay

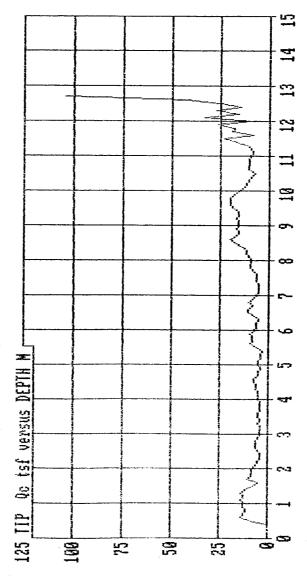
Soil interpretation reference: Robertson & Campanella-1983, based on 60% hammer efficiency and .2 m sliding data average

DEPTH meters	DEPTH feet	TIP Qc tsf	FRICTION Fs tsf	FR RATIO Fs/Qc :	INC I deg	
9.10	29.9	15.8	0.521	3.30	0.0	silty clay to clay
9.20	30.2	16.4	0.546	3.33	0.0	silty clay to clay
9.30	30.5	16.1	0.635	3.95	0.0	
9.40	30.8	16.0	0.743	4.55	0.0	
9.50	31.2	19.0	0.793	4.18	0.0	· ·
9.60	31.5	19.6	0.740	3.78	0.0	silty clay to clay
9.70		19.3	0.752	9,56	0.0	silty clay to clay
9.80	32.2	19.9	0.625	1.04	0.0	clayey silt to silty clay
9.90		18.0	0.576	3.20	0.0	clayey silt to silty clay
10.00	32.8	15.6	0,453	1.91	0.0	clayey silt to silty clay
10.10		12.3	0.405	5,30	0.0	silty clay to clay
10.20		11.0	0.430	3.81	0.0	clay
10.30		10.4	0.417	3,99	0.0	clay
10.40	34.1	9.8	0.229	3.33	0.0	silty clay to clay
10.50		7.8	0.372	4.77	0.0	clay
10.60	34.8	8.01	0.348	3.22	0.0	clay
10.70	35.1	10.3	0.317	3.07	0.0	silty clay to clay
10.80	35.4	10.2	0.331	3.25	0.0	silty clay to clay
10.90	35.8	10.0	0.295	2.94	0.0	silty clay to clay
11.00	36.1	9.2	0.245	2.65	0.0	silty clay to clay
11.10	36.4	8.3	0.218	2.63	0.0	silty clay to clay
11.20	36.7	8.9	0.204	2.28	0.0	silty clay to clay
11.30	37.1	11.4	0.445	3.89	0.0	clay
11.40	37.4	16.8	1.209	7.18	0.0	clay
11.50	37.7	22.9	0.573	2,51	0.0	silty clay to clay
11.60	38.1	8.5	0.247	2.91	0.0	clayey silt to silty clay
11.70	38.4	18.3	0.295	1.61	0.0	clayey silt to silty clay
11.80	38.7	17.8	0.354	1.98	0.0	sandy silt to clayey silt
11.90	39.0	26.2	0.525	2.00	0.0	clayey silt to silty clay
12.00	39.4	9,5	0.417	4.41	0.0	clayey silt to silty clay
12.10	39.7	33.3	0.610	1.83	0.0	clayey silt to silty clay
12.20	40.0	15.5	0.692	4.45	0.0	clayey silt to silty clay
12.30	40.4	27.3	0.550	2.05	0.0	clayey silt to silty clay
12.40	40.7	14.5	0.350	2.41	0.0	clayey silt to silty clay
12.50	41.0	24.5	0.614	2.49	0.0	clayey silt to silty clay
12.50	41.3	42.3	1.172	2.77	0.0	?
12.70	41.7	104.6	?	?	0.0	?

Soil interpretation reference: Robertson & Companella-1983, based on 60% hammer efficiency and .2 m sliding data everage

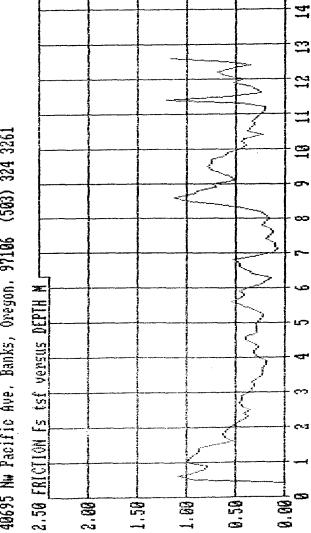
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OPERATOR: S.UAN
CLIENT: WES
JOB No. : DACH39-94-M-5062

Vandehey Soil Exploration 40695 Nw Pacific Ave. Banks, Oregon. 97106 (503) 324 3261



SOUNDING DATA IN FILE SHD-91 86-26-94 19:28
OPERATOR: S.UAN
CLIEMT: WES
JOB NO.: DACH39-94-N-5862

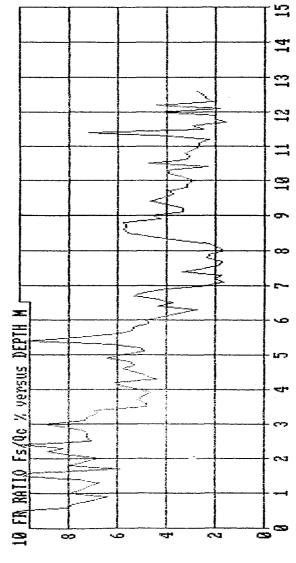
Vandehey Soil Exploration 40695 Nw Pacific Ave. Banks, Oregon, 97106 (503) 324 3261



12

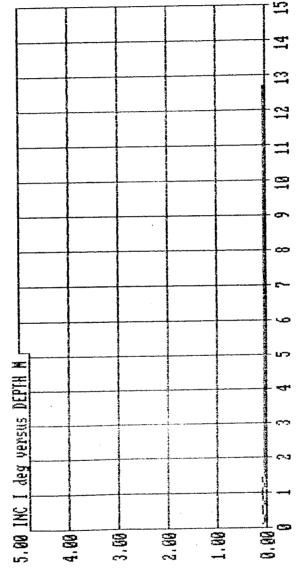
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OPERATOR: S.UAN
LOCATION: P-1/BFC-KC MO
CLIENT: WES
JOB No. : DACU39-94-M-5062





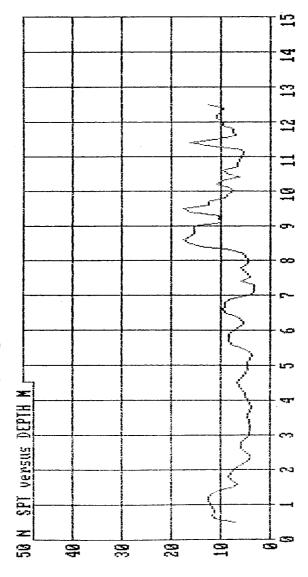
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OPERATOR: S.UAN
CLIENT: HES
JOB NO.: DACH39-94-M-5862

Vandehey Soil Exploration 40695 Nw Pacific Ave. Banks, Oregon. 97106 (503) 324 3261



SOUNDING DATA IN FILE SND-91 86-26-94 19:28
OPERATOR: S.UAN
CLIENT: WES JOB NO. : DACW39-94-M-5862

Vandehey Soil Exploration 40695 Nw Pacific Ave. Banks, Oregon. 97106 (503) 324 3261



SCPT P-2

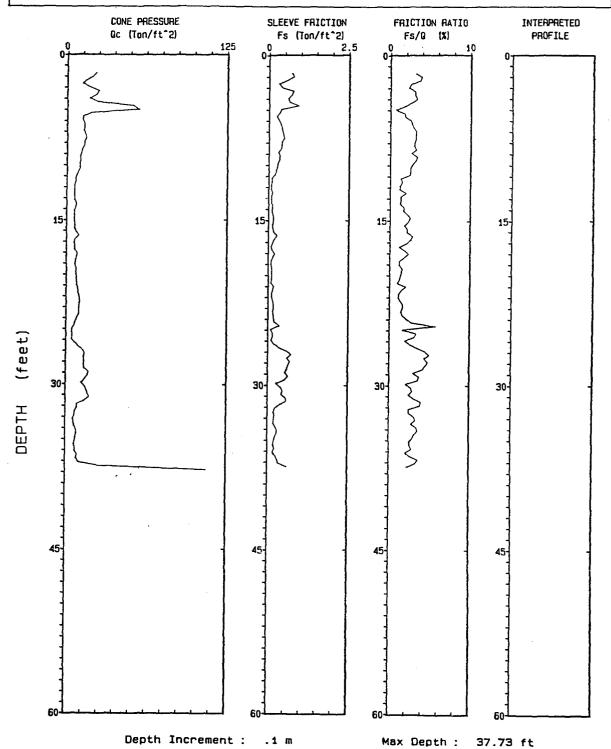
Vandehey Soil Expl

Operator : S.VAN
Sounding : SND102 Pg 1 / 1

CPT Date: 06-29-94 19:48 Location: P-2/BFC-KC MO

Client: WES

Job No. : DACW39-94-M-5062



SOUNDING DATA IN FILE SND102 06-29-94 19:48

OPERATOR : S.VAN LOCATION : P-2/BFC-KC MO

CLIENT: WES JOB No.: DACW39-94-M-5062

Vandehey Soil Exploration 40695 Nw Facific Ave. Banks, Oregon. 97106 (503) 324 3261

DEPTH	DEPTH	TIP	FRICTION	FR RATIO	INC	INTERPRETED
meters	feet	Qc tsf	Fs tsf	Fa∕Qc ¥	I deg	SOIL TYPE
0.50		22.5	0.715	3.15	0.1	7
0.50		19.7	9,772	3.91	0.1	silty clay to clay
0.70		14.8	0.543	3.E7	0.1	silty clay to clay
0.80	2.6	11.7	0.290	2.52	9.1	clayey silt to silty clay
0.50		17.6	0.398	2.25	0.1	clayey silt to silty clay
00.1	3.3	24.€	0.766	3.11	0.1	clayey silt to silty clay
1.10		22.8	0.704	3.09	0.1	clayey silt to silty clay
1,20	3.9	17.6	0.589	3.39	0.1	clayey silt to silty clay
1.30	4.3	23.5	0.637	2.71	0.1	sandy silt to clayey silt
1.40	4.6	51.5	0.920	1.79	0.1	silty sand to sandy silt
1.50	4.9	56.6	0.374	0.66	0.1	silty sand to sandy silt
1.60	5.2	18.4	0.321	1.75	0.1	sandy silt to clayey silt
1.70	5.6	12.1	0.227	1.87	0.1	clayey silt to silty clay
1.80	5.9	11.7	0.295	2.53	0.1	clayey silt to silty clay
1.90	6.2	13.2	0.359	2.71	0.1	clayey silt to silty clay
2.00	6.6	13.7	0.403	2.94	0.1	silty clay to clay
2.10	6.9	12.8	0.419	3.27	0.1	silty clay to clay
2.20	7.2	14.2	0.450	3.17	0.1	silty clay to clay
2.30	7.5	14.6	0.469	3.21	0.1	silty clay to clay
2.40	7.9	13.2	0.399	3.02	0.1	silty clay to clay
2.50	8.2	13.2	0.392	2.96	0.1	silty clay to clay
2.50	8.5	11.5	0.371	3.23	0.1	silty clay to clay
2.70	8.9	10.8	0.283	2.61	0.1	silty clay to clay
2.80	9.2	9.9	0.340	3.42	0.1	silty clay to clay
2.90	9.5	10.6	0.338	3.18	0.1	silty clay to clay
3.00	9.8	9.8	0.274	2.79	0.1	silty clay to clay
3.10	10.2	10.2	0.258	2.52	0.1	silty clay to clay
3.20	10.5	8.6	0.213	2.49	0.1	silty clay to clay
3.30	10.8	7.6	0.188	2.47	0.1	silty clay to clay
3.40	11.2	6.6	0.085	1.29	0.1	silty clay to clay
3.50	11.5	6.6	0.100	1.51	0.1	sensitive fine grained
3.60	11.8	5.7	0.067	1.18	0.1	sensitive fine grained
3.70	12.1	6.1	0.072	1.19	0.1	sensitive fine grained
3.80	12.5	6.2	0.12E	2.02	0.2	silty clay to clay
3.90	17.8	6.3	0.082	1.30	0.1	sensitive fine grained
	13.1	6.3	380.0	1.36	0.1	sensitive fine grained
	13.5	7.4	0.092	1.24	0.1	clayey silt to silty clay
	13.8	7.1	0.125	1.76	0.1	silty clay to clay
4.30	14.1	5.7	0.095	1.65	0.1	silty clay to clay
4.40	14.4	6.0	0.131	2.19	0.1	silty clay to clay
						=

Soil interpretation reference: Rebertson & Campanella-1983, based on 60% hammer efficiency and .2 m sliding data average

DEPTH D	EPTH	TIF	FRICTION	FR RATIO	INC	INTERPRETED
	feet	Oc tsf	Fs tsf	Fs/Qc 4	I deg	SOIL TYPE
#81812	reet	QU USI	15 (5)	range 4	r nea	ODIE THE
4.50	14.B	6.0	0.150	2.51	0.1	silty clay to clay
4.60	15.1	6.0	0.134	2.23	6.1	silty clay to clay
4.70	15.4	€.5	0.115	1.79	0.1	silty clay to clay
4.80	15.7	6.5	0.140	2.16	0.1	silty clay to clay
4.90	16.1	7.7	0.168	2.18	0.1	silty clay to clay
5.00	16.4	9.4	0.264	2.82	0.1	silty clay to clay
5.10	16.7	€.5	0.169	2.59	0.1	silty clay to clay
5.20	17,1	5.8	0.119	2.04	0.1	silty clay to clay
5.30	17.4	6.5	0.074	1.14	0.1	sensitive fine grained
5.40	17.7	€.2	0.115	1.84	0.1	silty clay to clay
5.50	18.0	8.3	0.193	2.32	0.1	silty clay to clay
	18.4	7.7	0.133	1.74	1.0	clayey silt to silty clay
	18.7	7.0	0.080	1.14	6.1	sensitive fine grained
	19.0	6.6	0.079	1.19	0.1	sensitive fine grained
	19.4	7.3	0.113	1.58	0.1	clayey silt to silty clay
	19.7	7.4	0.106	1.44	0.1	clayey silt to silty clay
	20.0	7.6	0.098	1.28	0.1	clayey silt to silty clay
	20.3	7.9	0.092	1.16	0.1	clayey silt to silty clay
	20.7	7.9	0.070	0.89	6.1	clayey silt to silty clay
	21.0	8.2	0.167	2.03	0.1	clayey silt to silty clay
	21.3	9.2	0.130	1.42	0.1	clayey silt to silty clay
	21.7	9.2	0.101	1.10	0.1	clayey silt to silty clay
	22.0	10.0	0.105	1.05	0.1	clayey silt to silty clay
	22,3	10.5	0.140	1.34	0.1	clayey silt to silty clay
	22.6	9.7	0.164	1.69	0.1	clayey silt to silty clay
	23.0	10.0	0.154	1.55	0.1	clayey silt to silty clay
	23.3	9.4	0.129	1.37	0.1	clayey silt to silty clay
	23.6	9.6	0.155	1.61	0.1	clayey silt to silty clay
	23.9	8.0	0.170	2.12	0.1	silty clay to clay
	24.3	7.1	0.200	2.82	0.1	clay
	24.6	5.2	0.361	5.82	0.1	clay
	24.9	4.5	0.074	1.64	0.1	clay
	25.3	4.3	0.143	3.35	0.1	clay
	25.6	4.3	0.134	3.11	0.1	clay
	25.9	4.6	0.089	1.94	0.1	clay
	26.2	7.1	0.179	2.51	0.1	silty clay to clay
	26.€	9.6	0.328	3.43	0.1	clay
	26.9	13.0	0.579	4.44	0.1	clay
	27.2	14.5	0.729	5.02	0.1	clay
	27.6	13.6	0.593	4.36	0.1	clay
	27.9	14.2	0.687	4.84	0.1	ciay
	28.2	13.8	0.517	4.48	0.1	clay
	28.5	14.2	0.597	4.21	0.1	silty clay to clay
	8.9	17.6	0.523	2.97	0.1	silty clay to clay
	29.2	16.7	0.622	3.73	0.1	silty clay to clay
	29.5	14.3	0.505	3.53	0.1	silty clay to clay
	29.9	12.1	0.252	2.08	0.2	clayey silt to silty clay
	30.2	14.9	0.406	2.74	0.2	clayey silt to silty clay
	30.5	16.1	0.462	2.88	0.2	clayey silt to silty clay
	80.8	17.1	0,416	2.43	0.2	clayey silt to silty clay
	•		-,			,-,, - <b></b> -,

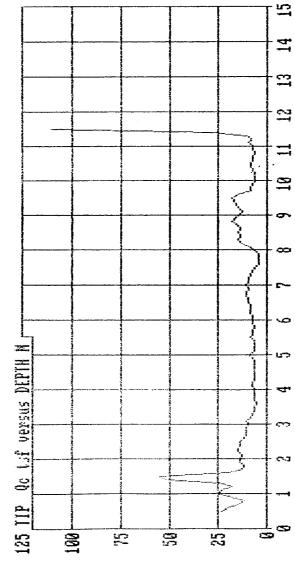
Soil interpretation reference: Robertson & Campanella-1983, based on 80% hammer efficiency and .2 m sliding data average

DEPTH meters	DEPTH feet	TIP Or tsf	FRICTION Fs tsf	FR RATIO	INC I dea	INTERPRETED Soil Type
AC 001 0	,000	<b>Q</b> D 00.	10 651	10140 0	. 203	0030 1772
9.50	31.2	18.2	0.560	3.08	0.2	clayey silt to silty clay
9.60	31.5	14.1	0.571	4.05	0.2	silty clay to clay
9.70	31.8	8.8	0.332	3.87	0.2	clay
9.80	32.2	8.5	0.205	2.41	0.2	silty clay to clay
9.90	32.5	6.9	0.169	2.45	0.2	silty clay to clay
10.00	32.8	6.7	0.210	3.14	0.2	clay
10.10	33.1	5.8	0.193	3.32	0.2	clay
10.20	33.5	6.4	0.177	2.75	0.2	clay
10.30	33.8	7.0	0.241	3.44	0.2	clay
10.40	34.1	8.2	0.299	3.59	0.2	clay
10.50	34.4	9.8	0.279	3.14	0.2	ciay
10.60	34.8	7.5	0.223	2.53	0.2	silty clay to clay
10.70	35.1	7.2	0.181	2.50	0.2	silty clay to clay
10.80	35.4	6.5	0.166	2.57	0.2	silty clay to clay
10.90	35.9	7.4	0.208	2.62	0.2	silty clay to clay
11.00	3€.1	7.2	0.144	2.00	0.2	silty clay to clay
11.10	36.4	9.1	0.243	2.68	0.2	silty clay to clay
11.20	35.7	8.5	0.309	3.65	0.2	clay
11.30	37.1	10.4	0.341	3.28	0.2	clayey silt to silty clay
11.40	37.4	26.7	0.601	2.25	0.2	?
11.50	37.7	109.9	;	?	0.2	?

Soil interpretation reference: Robertson & Campanella-1983, based on 60% hammer efficiency and .2 m sliding data average

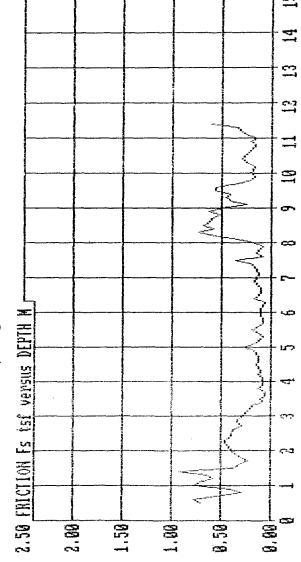
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OPERATOR: S.UAN
CLIENT: WES
JOB No.: DACW39-94-M-

Vandehey Soil Exploration 48695 Nw Pacific Ave. Banks, Oregon, 97106 (503) 324 3261



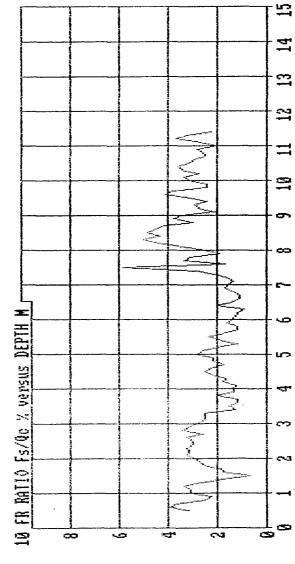
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OPERATOR: S.UAN
CLIENT: MES
JOB NO. : DACU39-94-M-586

Vandehey Soil Exploration 40695 Nw Pacific Ave. Banks, Oregon, 97106 (503) 324 3261



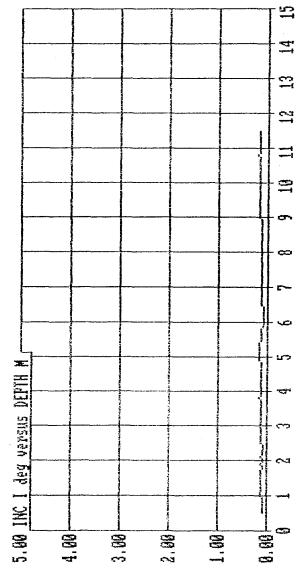
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Vandehey Soil Exploration 40695 Nw Pacific Ave. Banks, Oregon. 97106 (503) 324 3261



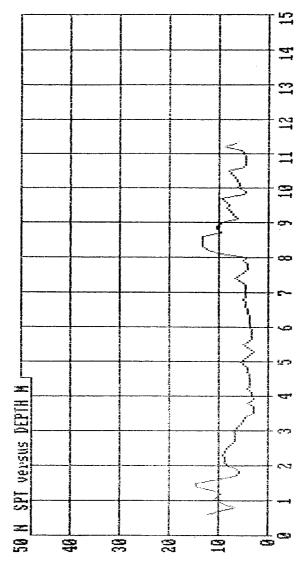
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OPERATOR: S.UAN
LOCATION: P-2/BFC-KC MO
CLIENT: WES
JOB NO.: DACW39-94-M-5062

Vandehey Soil Exploration 40695 Nw Pacific Ave. Banks, Oregon. 97106 (503) 324 3261



SOUNDING DATA IN FILE SHD182 86-29-94 19:48
OPERATOR: S.UAH
CLIENT: WES
JOB NO.: DACM39-94-M-5862

Vandehey Soil Exploration 40695 Nw Pacific Ave. Banks, Oregon, 97106 (503) 324 3261



SCPT P-3

/andehey Soil Expl

Operator : S.VAN

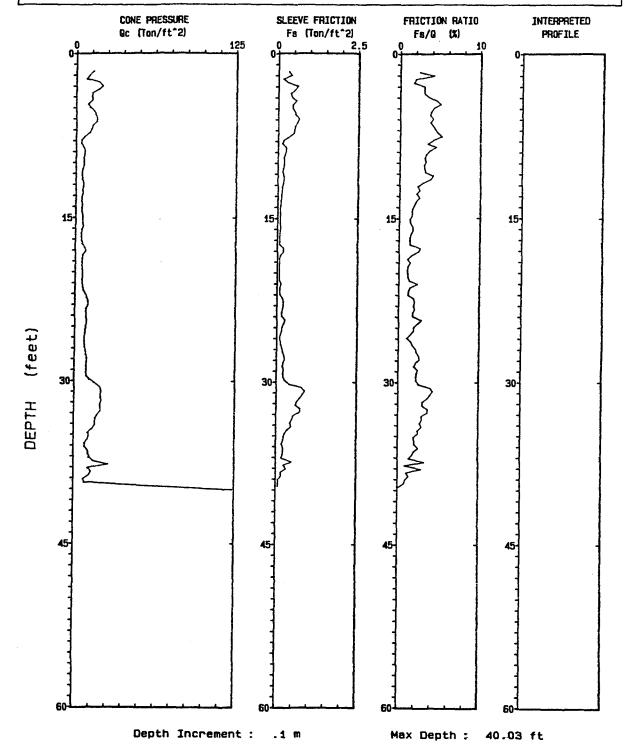
CPT Date : 06-30-94 16: 16

Sounding: SND106 Pg 1 / 1

Location: P-3/BFC-KC MO

Client : WES

Job No. : DACW39-94-M-5062



SOUNDING DATA IN FILE SND106 06-30-94 16:16

OPERATOR : S.VAN LOCATION : P-3/BFC-KC MO

CLIENT: WES JOB No.: DACW39-94-M-5062

Vandehey Soil Exploration 40895 Nw Pacific Ave. Banks, Oregon. 97106 (503) 324 3261

DEPTH	DEFTH	TIP	FRICTION	FE RATIO	INC	INTERPRETEC
meters	feet	Oc tsf	Fs te	Fs/Qc %	ī deg	SOIL TYPE
0.50	1.5	13.3	0.327	2.46	0.3	•
0.60		9.9	0.417	4.20	0.3	silty clay to clay
0.70	2.3	7.7	(),]44	1.87	0.1	clayey silt to silty clay
0.80	2.6	17.7	0.299	1.69	0.1	clayey silt to silty clay
0.90	3.6	20.6	0.820	3.02	0.1	clayey silt to silty clay
1.00	3.3	17.2	0.564	2.93	0.1	clayey silt to silty clay
1.10	3.5	12.4	0.392	3.09	0.1	silty clay to clay
1.20	3.9	11.9	0.435	3.65	0.1	clay
1.30	4.3	12.6	0.573	4.54	0.1	clay
1.40	4.6	8.9	0.447	5.01	0.1	clay
1.50	4.9	10.7	0.444	4.14	0.1	clay
1.60	5.2	13.8	0.524	3.80	0.1	clay
1.70	5.6	15.0	0.560	3.74	0.1	silty clay to clay
1.80	5.9	16.0	0.654	4.08	0.1	silty clay to clay
1.90	6.2	16.0	0.593	3.72	0.1	silty clay to clay
2.00	6.6	12.6	0,517	4.10	0.1	clay
2.10	6.9	11.5	0.501	4.34	0.1	clay
2.20	7.2	10.2	0.473	4.65	0.1	clay
2.30	7.5	6.7	0.348	5.20	0.1	clay
2.40	7.9	4.1	0.168	4.11	0.1	clay
2.50	8.2	3.7	0.128	3.42	0.1	clay
2.60	8.5	5.7	0.253	4,46	0.1	clay
2.70	9.9	6.8	0.246	3.63	0.1	clay
2.80	5.2	6.2	0,198	3.20	0.1	clay
2.90	9.5	5.8	0.178	3.07	0.1	clay
3.00	9.8	6.2	0.202	3.24	0.1	clay
3.10	10.2	8.2	0.164	2.97	0.1	clay
3.20	10.5	5.1	0.157	3.07	0.1	clay
3.30	10.8	4.5	0,144	3.18	0.1	clay
3.40	11.2	4.4	0.191	4.14	0.1	clay
3.50 3.60	11.5	5.2	0.158	3.79	0.1	clay
3.70	11.8	5.8	0.185	2.93	0.1	clay
3.80	12.1 12.5	5.8 4.8	0.125	2.16	0.1	silty clay to clay
3.90	12.5	5.3	0.115	2.48	0.1 0.1	silty clay to clay
3.50 4.00	13.1	5.3 4.2	0.109 0.102	2.06 2.44	0.1	clay
	13.1	4.4		2.4%	0.1	clay
	13.5 13.8	4.4 5.1	0.091 0.094	1.83	0.1	silty clay to clay silty clay to clay
	14.1	5.1 4.5	0.034	1.53	0.1	sensitive fine grained
	14.4	4.5	0.067	1.50	0.1	sensitive fine grained
7,70	17.4	4.5	יפט.ט	1.50	0.1	sensitive time grained

Soil interpretation reference: Robertson & Campanella-1983, based on 60% hammer efficiency and .2 m sliding data average

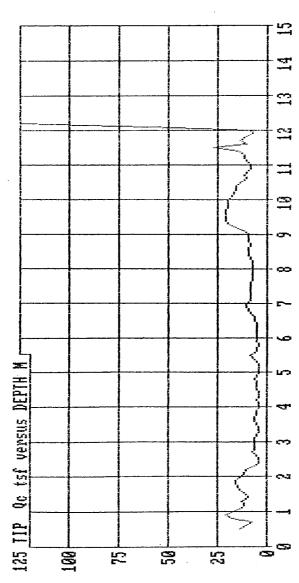
DEDT!!	BERTH	***	*********		#11A	***************************************
DEPTH	DEPTH	TIP	FRICTION	FR RATIO	INC	INTERPRETED
meters	feet	Qc tsf	Fs tsf	Fs/Qc %	I deg	SOIL TYPE
4.50	14.8	5.4	0.082	1.53	0.1	sensitive fine grained
4.60	15.1	5.3	0.087	1.27	0.1	sensitive fine grained
4.70	15.4	5.1	0.071	1.39	0.1	sensitive fine grained
4.80	15.7	6.1	0.102	1.68	0.1	sensitive fine grained
4.90	15.1	4.8	0.091	1.71	0.1	sensitive fine grained
5.00	16.4	4.3	0.083	1.45	0.1	sensitive fine grained
5.10	16.7	4.2	0.055	1.29	.0.1	sensitive fine grained
5.20	17.1	4.6	0.066	1.30	0.1	sensitive fine grained
5.30	17.4	5.5	0.075	1.42	0.1	silty clay to clay
5.40	17.7	7.4	0.157	2.66	0.1	silty clay to clay
5.50	18.0	7.9	0.185	2,35	0.1	silty clay to clay
5.60	18.4	5.5	130.0	1.49	0.1	silty clay to clay
5.70	18.7	5.0	0.051	1.01	0.1	sensitive fine grained
5.80	19.0	4.7	0.055	1.38	0.1	sensitive fine grained
5.90	19.4	5.1	0.055	1.09	0.1	sensitive fine grained
6.00	19.7	5.4	0.055	1.02	0.1	sensitive fine grained
6.10	20.0	5.7	0.052	1.08	1.0	sensitive fine grained
€.20	20.3	5.2	0.059	1.13	0.1	sensitive fine grained
E.30	20.7	4.9	0.064	1.29	0.1	sensitive fine grained
6.40	21.0	5.1	0.118	2.30	0.1	silty clay to clay
6.50	21.3	6.0	0.082	1.36	0.7	sensitive fine grained
6.60	21.7	6.6	0.076	1.16	0.2	sensitive fine grained
6.70	22.0	8.2	0.032	1.13	0.2	clayey silt to silty clay
6.80	22.3	9.0	0.167	1.85	0.2	clayey silt to silty clay
6.90	22.6	10.1	0.199	1.96	0.2	clayey silt to silty clay
7.00	23.0	10.0	0.182	1.81	0.2	clayey silt to silty clay
7.10	23.3	6.5	0.172	2.02	0.2	clayey silt to silty clay
7.20	23.6	8.3	0.144	1.73	0.2	clayey silt to silty clay
7.30	23.9	8.7	0.153	1.76	0.2	silty clay to clay
7.40	24.3	8.9	0.253	2.87	0.2	silty clay to clay
7.50	24.E	8.8	0.203	2.30	0.2	silty clay to clay
7.60 7.70	24.9 25.3	8.1 7.7	0.149	1.84	0.2	silty clay to clay
			0.143	1.65	0.2	clayey silt to silty clay
7.80 7.90	25.6 25.9	7.7 7.1	<pre></pre>	1.45 1.02	0.2 0.2	clayey silt to silty clay sensitive fine grained
8.00	26.2	7.1	0.108	1.52	0.2	clayey silt to silty clay
8.10	26.6	7.3	0.124	1.71	0.2	silty clay to clay
8.20	26.9	7.5	0.157	2.08	0.2	silty clay to clay
8.30	27.2	8.3	0.188	2.26	0.2	silty clay to clay
8.40	27.6	8.9	0.227	2.56	0.2	silty clay to clay
8.50	27.9	9.6	0.250	2.61	0.3	silty clay to clay
8.60	28.2	9.2	0.195	2.12	0.3	silty clay to clay
8.70	28.5	8.8	0.169	1.91	0.3	silty clay to clay
8.80	28.9	8.9	0.215	2.41	0.3	silty clay to clay
8.90	29.2	8.9	0.202	2.26	0.2	silty clay to clay
9.00	29.5	9.5	0.205	2.20	0.2	clayey silt to silty clay
9.10	29.9	11.8	0.266	2.26	0.2	clayey silt to silty clay
9.20	30.2	15.6	0.403	2.58	0.2	clayey silt to silty clay
9.30	30.5	19.6	0.788	4.02	0.2	silty clay to clay
9.40	30.8	20.7	0.886	4.28	0.2	silty clay to clay

Soil interpretation reference: Robertson & Campanella-1983, based on 60% hammer efficiency and .2 m sliding data average

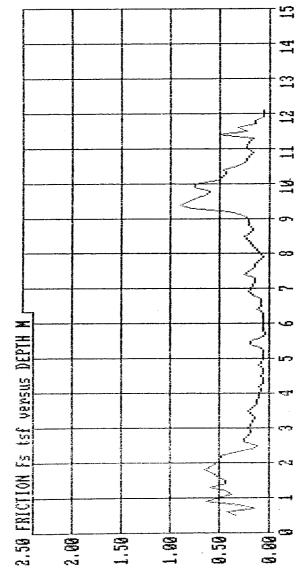
DEPTH meters	DEPTH feet	TJP Qc tsf	FRICTION Fs tsf	FR RATIO Fs/Qc 2	INC I deg	INTERPRETED SOIL TYPE
9.50	31.2	20.6	0.810	3.93	0.3	silty clay to clay
9.60	31.5	20.4	0.732	3.59	0.3	silty clay to clay
9.70	31.8	21.2	0.634	2.99	0.3	clayey silt to silty clay
9.80	32.2	19.9	0.596	2.99	0.3	clayey silt to silty clay
9.90	32.5	20.3	0.745	3.68	0.3	silty clay to clay
10.00	32.8	20.3	0.747	3.68	0.3	silty clay to clay
10.10	33.1	18.0	0.522	2.90	0.3	clayey silt to silty clay
10.20	33.5	16.3	0.494	2.97	0.3	clayey silt to silty clay
10.30	33,8	16.1	0.431	2.69	0.3	clayey silt to silty clay
10,40	34.1	15.9	0.455	2.94	0.3	clayey silt to silty clay
10.50	34,4	13.9	0.3-3	2.45	0.3	clayey silt to silty clay
10.60	34.8	10.7	0.260	2.44	0.3	clayey silt to silty clay
10.70	35.1	11.5	0.215	1.91	0.3	clayey silt to silty clay
10.80	35.4	10.2	0.212	2.03	0.3	clayey silt to silty clay
10.99	35.8	8.3	0.171	2.06	0.3	silty clay to clay
11.00	36.1	9.8	0.271	2.56	0.3	silty clay to clay
11.10	36.4	10.9	0.219	2.02	0.3	clayey silt to silty clay
11.20	36.7	11.3	0.198	1.75	0.3	clayey silt to silty clay
11.30	37.1	11.8	0.165	1.40	0.3	clayey silt to silty clay
11.40	37.4	15.1	0.501	3.32	0.3	clayey silt to silty clay
11.50	37.7	27.0	0.23E	0.87	0.5	sandy silt to clayey silt
11.60	38.1	10.8	0.315	2.92	0.5	clayey silt to silty clay
11.70	38.4	13.3	0.139	1.04	0.5	clayey silt to silty clay
11.80	38.7	11.6	0.155	1.34	0.5	clayey silt to silty clay
11.90	39.0	7.4	0.067	0.91	0.5	clayey silt to silty clay
12.00	39.4	8.5	0.066	0.77	0.5	silty sand to sandy silt
12.10	39.7	60.4	0.057	0.09	0.5	?
12.20	40.0	123.9	៌	?	0.5	3

Soil interpretation reference: Acceptant & Campanella-1983, based on 60% hammer efficiency and .2 m sliding data average

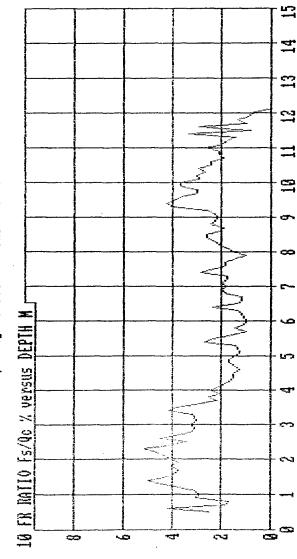
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OPERATOR: S.UAN
LOCATION: P-3/BFC-KC MO
CLIENT: WES
JOB No.: DACH39-94-M-5862



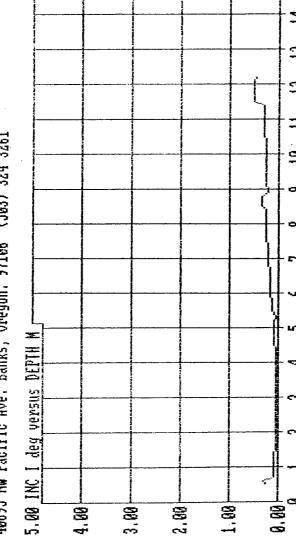
SOUNDING DATA IN FILE SND106 06-30-94 16:16
OPERATOR: S.UAN
CLIENT: WES
JOB No.: DACW39-94-M-5062



SOUNDING DATA IN FILE SHDIBG 86-38-94 16:16
OPERATOR: S.UAN
CLIENT: MES
JOB NO. : DACH39-94-M-5062

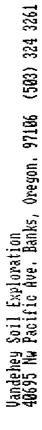


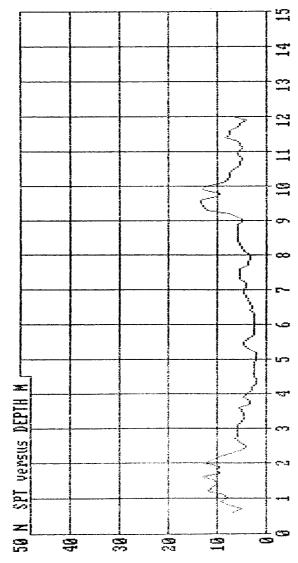
SOUNDING DATA IN FILE SND106 06-30-94 16:16 OPERATOR: S.UAN 100-100 1 P-3/BFC-KC MO CLIENT: WES: JOB No. : DACH39-94-M-5062 Vandehey Soil Exploration 40695 Nw Pacific Ave. Banks, Oregon. 97106 (503) 324 3261



뜨

SOUNDING DATA IN FILE SWDIGG 06-30-94 16:16
OPERATOR: S.UAN
CLIENT: WES JOB No. : DACW39-94-M-5062





SCPT P-4

Vandehey Soil Expl.

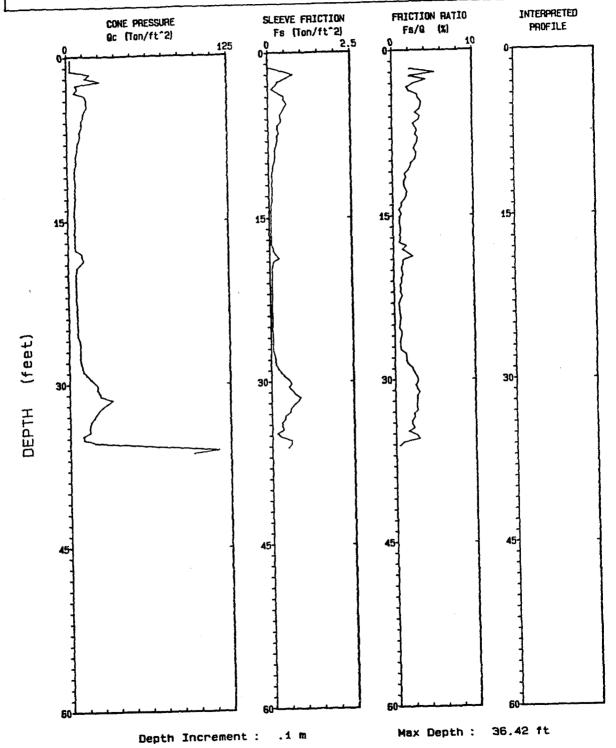
Operator : S.VAN

Sounding: SND107 Pg 1 / 1

Client: WES

CPT Date: 06-30-94 17:42 Location: P-4/BFC-KC MO

Job No. : DACW39-94-M-5062



SOUNDING DATA IN FILE SND107 06-30-94 17:42

OPERATOR : S.VAN

LOCATION : P-4/BFC-KC MO

CLIENT : WES

JOB No. : DACW39-94-M-5062

Vandehey Soil Exploration 40695 Nw Pacific Ave. Banks, Oregon. 97106 (503) 324 3261

DEPTH	DEPTH	TIP	FRICTION	FR RATIO	INC	INTERPRETED
meters	feet	On tof	Fs ts+	Fs/Qc %	I deg	SOIL TYPE
0.10	0.3	2.9	-0.009	-0.30	0.0	?
0.20	0.7	3.0	-0.010	-0.33	0.0	7
0.30	1.6	3.0	~0.010	-0.33.	0.0	?
0.40	1.3	2.8	200.00	-0.07	0.1	sensitive fine grained
0.50	1.6	18.0	0.397	2.20	0.1	silty clay to clay
0.80	2.0	14.5	0.773	5.32	0.0	silty clay to clay
0.70	2.3	28.0	0.564	2.17	0.0	clayey silt to silty clay
0.80	2.€	6.8	0.287	4.25	0.0	silty clay to clay
0.90	3.0	8.1	0.216	2.67	0.0	clay
1.00	3.3	5.7	0.102	1.79	0.0	silty clay to clay
1.10	3.6	13.8	0.288	2.09	0.0	clayey silt to silty clay
1.20	3.9	15.3	0.473	3.09	0.0	clayey silt to silty clay
1.30	4.3	14.9	0.482	3.24	0.0	silty clay to clay
1.40	4.6	15.7	0.569	3.62	0.0	silty clay to clay
1.50	4.9	13.8	0.490	3.54	0.0	silty clay to clay
1.60	5.2	12.9	0.438	3.38	0.0	silty clay to clay
1.70	5.8	12.5	0.358	2.86	0.0	silty clay to clay
1.89	5.9	11.1	0.386	3.47	0.0	silty clay to clay
1.90	6.2	11.5	0.372	3.25	0.0	silty clay to clay
2.00	6.6	11.0	0.285	2.59	0.0	silty clay to clay
2.10	5.9	9.3	0.267	2.87	0.0	silty clay to clay
2.20	7.2	10.1	0.309	3.06	0.1	silty clay to clay
2.30	7.5	9.3	0.261	2.81	0.0	silty clay to clay
2.40	7.9	8.1	0.257	3.17	0.0	silty clay to clay
2.50	8.2	7.8	0.238	3.03	0.0	clay
2.60	8.5	7.4	0.211	2.84	0.0	silty clay to clay
2.70	8.9	6.9	0.182	2.63	0.0	silty clay to clay
2.80	9.2	6.4	0.186	2.92	0.0	clay
2.90	9.5	6.5	0.186	2 <b>.8</b> 6	0.0	clay
3.00	9.8	<b>3.3</b>	0.184	2.78	0.0	clay
3.10	10.2	5.7	0.128	2.27	0.0	silty clay to clay
	10.5	5.3	0.112	2.12	0.0	silty clay to clay
	10.8	5.5	0.106	1.93	0.0	silty clay to clay
	11.2	5.3	0.079	1.48	0.0	sensitive fine grained
	11.5	6.0	0.099	1.65	0.0	sensitive fine grained
	11.8	5.7	0.077	1.34	0.0	sensitive fine grained
	12.1	5.5	0.077	1.40	0.0	sensitive fine grained
	12.5	5.5	0.082	1.51	0.0	sensitive fine grained
	12.8	5.7	0.098	1.72	0.0	sensitive fine grained
4.00	13.1	5.6	0.094	1.67	0.0	sensitive fine grained

Soil interpretation reference: Robertson & Campanelia-1983, based on 60% hasmer efficiency and .2 m sliding data average

SND107 : P-4/BFC-KC MO : 06-30-94 17:42 PAGE 2

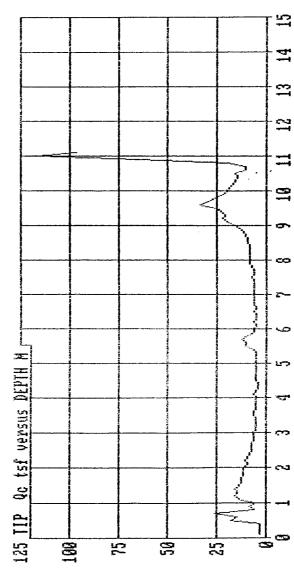
					7115	INTERPRETED
		-		FR RATIO	INC	SOIL TYPE
peters fo	eet Qc	tsf	s tsf	Fs/Qc ≇	I deg	SOIL THE
		<i>-</i> -	6 604	1,43	0.0	sensitive fine grained
		5.9	0.084		0.0	sensitive fine grained
		5.0	0.050	0.99	0.0	sensitive fine grained
	4.1	4.6	0.045	0.98		sensitive fine grained
	4.4	4.£	0.032	0.70	0.0	sensitive fine grained
		5.7	0.058	1.02	0.0	sensitive fine grained
	5.1	5.E	0.042	0.75	0.0	sensitive fine grained
	5.4	5.3	0.041	0.80	0.0	
	5.7	5.5	0.044	0.79	0.0	sensitive fine grained
	6.1	5.0	() *(jara	0.88	0.0	sensitive fine grained
5.00 1	6.4	5.0	$\xi \omega_{1}(0)$	0.95	0.0	sensitive fine grained
5.10 1	B.7	5.7	(+,()+)	0.79	0.0	sensitive fine grained
	7.1	5.1	0.041	0.81	0.0	sensitive fine grained
5.30 1	7.4	4.8	9.034	0.71	0.0	sensitive fine grained
5.40 1	7.7	6.1	0.097	1.59	0.0	sensitive fine grained
5.50 1	0.8	10.7	0.115	1.07		clayey silt to silty clay
5.60 5	18.4	10.7	$0.18^{2}$	1.72	0.0	clayey silt to silty clay
5.70 1	18.7	12.1	0.292	2.42	0.0	clayey silt to silty clay
5.80 1	19.0	9.4	0.105	1.12	0.1	clayey silt to silty clay
5.90	19.4	6.6	0.072	1.09	0.0	sensitive fine grained
6.00	19.7	6.0	0.058	0.96	0.0	sensitive fine grained
6.10	20.0	5.7	0.055	0.97	0.0	sensitive fine grained
6.20	20.3	6.0	0.068	1.13	0.0	sensitive fine grained
6.30	20.7	5.7	0.051	0.90	0.0	sensitive fine grained
6.40	21.0	5.6	0.057	1.02	0.0	sensitive fine grained
6.50	21.3	6.1	0.044	0.73	0.0	sensitive fine grained
6.60	21.7	5.6	0.045	0.80	0.0	sensitive fine grained
€.70	22.0	5.8	0.04E	0.80	0.0	sensitive fine grained
6.80	22.3	6.1	0.059	0.97	0.0	sensitive fine grained
	22.6	6.7	0.043	0.69	0.0	sensitive fine grained
	23.0	8.5	0.037	0.58	0.0	sensitive fine grained
	23.3	€.4	0.036	0.56	0.0	sensitive fine grained
	23.€	8.2	0.039	0.62	0.0	sensitive fine grained
	23.9	6.1	0.040	0.66	0.0	sensitive fine grained
	24.3	8.2	0.048	0.78	ű.0	sensitive fine grained
	24.6	8.8	0.042	0.61	0.0	sensitive fine grained
	24.9	6.7	0.039	0.58	0.0	sensitive fine grained
	25.3	6.4	0.037	0.57	0.0	sensitive fine grained
	25.6	6.8	0.059	38.0	0.0	sensitive fine grained
	25.9	7.8	0.063	0.80	0.0	sensitive fine grained
8.00	26.2	9.5	0.05	0.67	0.0	sensitive fine grained
8.10	26.6	8.8	0.05	0.60	0.0	sensitive fine grained
8.20	26.9	8.5	0.05	0.69	0.0	
8.30	27.2	8.4	0.053	2 0.74	0.0	clayey silt to silty clay
8.40	27.6	8.4	0.11		0.0	clayey silt to silty clay
8.50	27.9	9.1	0.13	2 1.45	0.0	
8.60	28.2	9.6	0.13	9 1.44	0.0	clayey silt to silty clay
8.70	28.5	10.5	0.17			
8.80	28.9	11.3	0.23		0.0	clayey silt to silty clay
8.90	29.2	13.5	0.31			
9.00	29.5	16.0	0.41			
0,,,,						

Soil interpretation reference: Robertson & Campanella-1983, based on 60% hammer efficiency and .2 m sliding data average

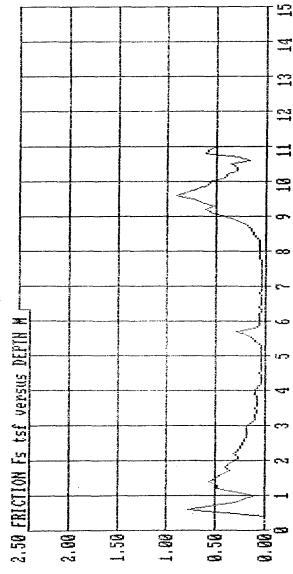
DEPTH meters	DEPTH feet	TIP Qc tsf	FRICTION Fs tsf	FR RATIO Fs/Qc 2	INC I deg	INTERPRETED SOIL TYPE
9.10	29.9	19.5	0.543	2.78	0.0	clayey silt to silty clay
9.20	30.2	22.2	0.614	2.77	0.0	clayey silt to silty clay
9.30	30.5	21.3	0.531	2.50	0.0	clayey silt to silty clay
9.40	30.8	23.1	0.643	2.78	0.0	clayey silt to silty clay
9.50	31.2	24.6	6.735	2.99	0.0	clayey silt to silty clay
9.60	31.5	33.5	0.897	2.65	0,0	sandy silt to clayey silt
9.70	31.8	29.6	103.0	2.76	0.0	sandy silt to clayey silt
9.80	32.2	25.7	9.078	2.64	0.0	clayey silt to silty clay
9.90	32.5	22.4	0.580	2.60	0.0	clayey silt to silty clay
10.00	32.8	20.3	0.560	2.76	0.0.	clayey silt to silty clay
10.10	33.1	18.5	0.417	2.26	0.0	clayey silt to silty clay
10.20	33.5	16.4	0.390	2.37	0.0	clayey silt to silty clay
10.30	<b>3</b> 3.5	15.1	0.300	1.98	0.0	clayey silt to silty clay
10.40	34.1	14.5	0,293	1.98	$\hat{0}.\hat{0}$	clayey silt to silty clay
10.50	34.4	15.4	0.350	2.28	0.0	clayey silt to silty clay
10.60	34.8	10.0	0.158	1.57	0.0	clayey silt to silty clay
10.70	35.1	10.7	0.278	2.50	0.0	clayey silt to silty clay
10.80	35.4	20.2	0.598	2.95	0.0	sandy silt to clayey silt
10.90	35.8	64.8	0.585	0.90	0.1	sand to silty sand
11.00	36.1	116.2	0.491	0.42	0.1	?
11.10	36.4	8.32	?	?	0.1	?

Scil interpretation reference: Robertson % Campanella-1983, based on 60% hammer efficiency and .2 m sliding data average

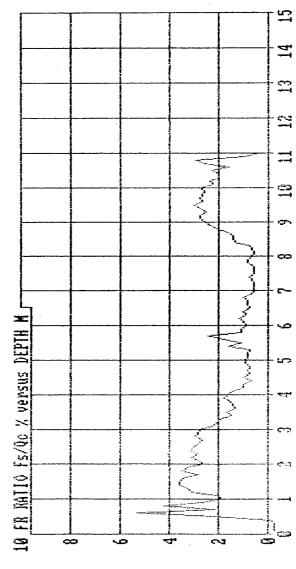
06-38-94 17:42 10CNTON | P-4/BFC-KC NO JOB No. | DACN39-94-N-5862 SOUNDING DATA IN FILE SHDIGY OPERATOR: S.UAN CLIENT; WES

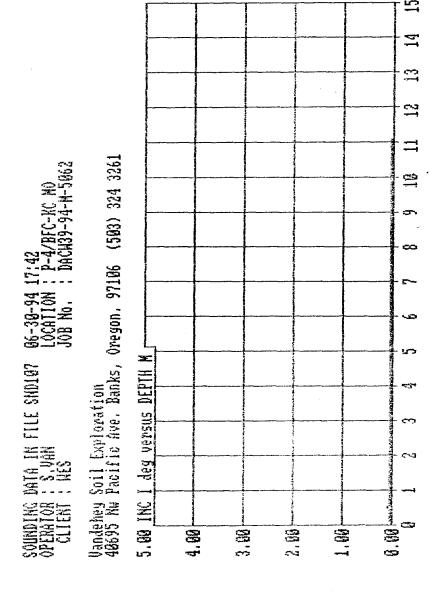


06-30-94 17:42 LOCATION : P-4/BFC-KC MO JOB No. : DACH39-94-M-5062 SOUNDING DATA IN FILE SNDIAT OPERATOR: S.UAN CLIENT: WES

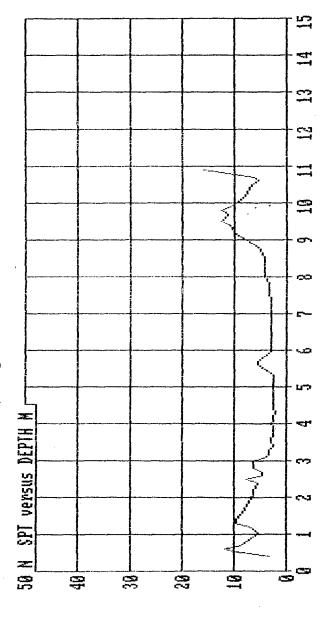


SOUNDING DATA IN FILE SNDLO7 OPERATOR : S.UAN CLIENT : WES





86-38-94 17:42 LOCATION : P-4/BFC-KC NO JOB No. : DACH39-94-M-58 SOUNDING DATA IN FILE SND187 OPERATOR: S.UAN CLIENT: MES



SCPT P-5

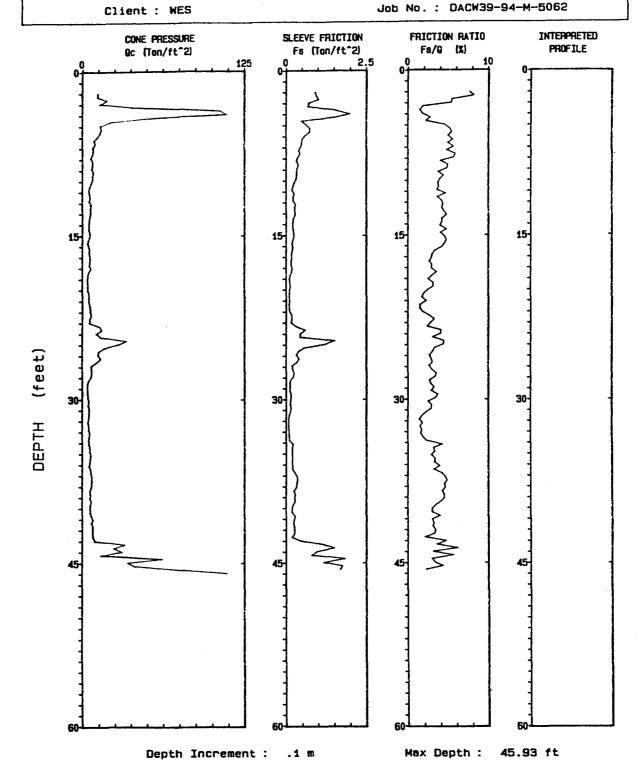
Vandehey Soil Expl

Operator : S.VAN

CPT Date: 06-27-94 15:58

Sounding : SND-92 Pg 1 / 1

Location: P5/BFC-KC MO



SOUNDING DATA IN FILE SND-92 06-27-94 15:58

OPERATOR : S.VAN

LOCATION : P5/BFC-KC MO

CLIENT : WES

JOB No. : DACW39-94-M-5062

Vandehey Soil Exploration

40695 Nw Pacific Ave. Banks, Oregon. 97106 (503) 324 3261

DEPTH	DEPTH	TIF	FRICTION	FR RATIO	INC	INTERPRETED
meters	feet	Qo tsf	Fs tsf	Fs/Qc ¥	I dag	SOIL TYPE
	<b>.</b>	44.6				
().2(.)	2.0	11.9	6.917	7.70	0.1	?
0.70	2.3	11.7	0.951	8.15	0.1	clay
0.80	2.6	18.9	1.022	5.41	0.1	clay
0.90	3.0	13.3	9.711	5.33	0.1	silty clay to clay
1.00	3.3	38.4	0.690	1.80	0.1	silty sand to sandy silt
1.10	3.6	106.3	1.547	1.45	0.1	silty sand to sandy silt
1.20	3.9	111.2	1.989	1.79	0.1	silty sand to sandy silt
1.30	4.3	54.9	1.508	2.75	0.1	sandy silt to clayey silt
1.40	4.6	21.8	0.483	2.22	0.1	clayey silt to silty clay
1.50	4.9	13.7	0.629	4.58	0.1	silty clay to clay
1.60	5.2	14.5	0.754	5.21	0.1	clay
1.70	5.6	13.5	0.736	5.45	0.1	clay
1.80 1.90	5.9 6.2	11.7	0.581	4.97	1.0	clay
2.00	6.E	8.9	0.497	5.57	0.1	clay
2.10	6.9	9.9	0.489	4.98	1.0	clay
2.20	7.2	8.1 8.0	0.458	5.68	0.1	clay
2.30	7.5	7.4	0.385 0.435	4.80	0.1	clay
2.40	7.9	6.3	0.435	5.87	0.1	clay
2.50	8.2	7.9	0.319	5.61 4.01	0.1	clay
2.60	8.5	7.8	0.362		0.0	clay
2.70	8.9	7.1	•	4.93	0.0	clay
2.80	9.2	8.5	0.340	4.81	0.0	clay
2.90	9.5	7.5	0.318 0.329	3.74	0.0	clay
3.00	9.8	7.7		4.40	0.0	clay
	10.2		0.301	3.92	0.0	clay
	10.5	6.6 5.5	0.245	3.70	0.0	clay
	10.5	5.5 4.8	0.209	3.82	0.0	clay
_	11.7		0.175	3.61	0.0	clay
		5.4	0.255	4.70	0.0	clay
	1.5 1.8	6.0 5.2	0.218	3.64	0.0	clay
	2.1	6.8	0.217	4.19	0.0	clay
	2.5	6.2	0.298	4.38	0.0	clay
	2.8	6.1	0.262	4.19	0.0	clay
	2.6 3.1	5.9	0.274	4.51	0.0	clay
			0.280	4.77	0.0	clay
	3.5 3.8	5.2	0.216	4.18	0.0	clay
		5.0	0.206	4.15	0.0	clay
	4.1	-5.0	0.197	3.95	0.0	clay
_	4.4	4.6	0.221	4.78	0.0	clay
4.50 14	4.8	5.9	0.237	4.01	0.0	clay

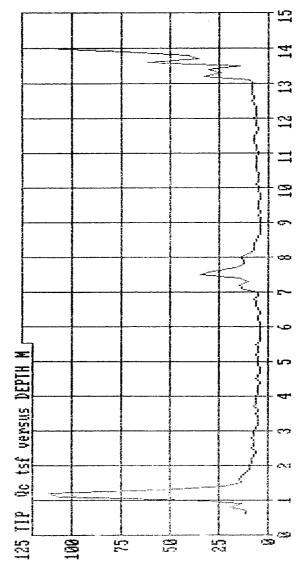
Soil interpretation reference: Robertson & Campanella-1983, based on 60% hammer efficiency and .2 m sliding data average

### Reet	DEPTH	NEPTH	TIP	FRICTION	FR RATIO	INC	INTERPRETED
4.60 15.1 5.5 0.248 4.54 0.0 clay 4.70 15.4 4.3 0.206 4.77 0.0 clay 4.80 15.7 4.0 0.181 4.52 0.0 clay 4.90 16.1 5.2 0.214 4.15 0.6 clay 5.00 16.4 5.6 0.184 3.30 0.0 clay 5.10 16.7 5.4 0.155 2.97 0.0 clay 5.20 17.1 6.1 6.75 0.155 2.97 0.0 clay 5.20 17.1 6.1 6.75 0.155 2.97 0.0 clay 5.30 17.4 5.7 0.148 2.62 0.0 clay 5.40 17.7 5.0 0.55 2.97 0.0 clay 5.50 18.0 6.5 0.182 2.97 0.0 clay 5.50 18.4 4.6 0.162 3.56 0.0 clay 5.70 18.7 3.9 0.116 2.95 0.0 clay 5.80 19.1 3.9 0.121 3.13 0.0 clay 5.80 19.1 3.9 0.121 3.13 0.0 clay 6.00 19.7 4.3 0.135 3.13 0.0 clay 6.00 19.7 5.1 0.096 1.89 0.0 silty clay to clay 6.20 20.3 5.1 0.098 1.92 0.0 silty clay to clay 6.30 20.7 5.1 0.066 1.89 0.0 silty clay to clay 6.50 21.3 5.6 0.663 1.48 0.0 silty clay to clay 6.60 21.7 6.2 0.090 1.45 0.0 silty clay to clay 6.60 22.3 6.9 0.182 2.65 0.0 silty clay to clay 6.70 22.0 6.3 0.117 1.84 0.0 silty clay to clay 6.80 22.3 6.9 0.182 2.65 0.0 silty clay to clay 6.80 22.3 6.9 0.182 2.65 0.0 silty clay to clay 7.00 23.0 5.5 0.184 2.77 0.0 silty clay to clay 7.00 23.0 5.5 0.185 2.77 0.0 silty clay to clay 7.00 23.0 5.5 0.184 2.77 0.0 silty clay to clay 7.20 23.6 14.9 0.609 4.09 0.0 silty clay to clay 7.20 23.6 14.9 0.609 4.09 0.0 silty clay to clay 7.20 23.6 14.9 0.609 4.09 0.0 silty clay to clay 7.20 23.6 14.9 0.609 4.09 0.0 silty clay to clay 7.20 23.6 14.9 0.609 4.09 0.0 silty clay to clay 7.20 25.6 12.3 0.371 3.02 0.0 silty clay to clay 7.20 25.8 14.9 0.609 4.09 0.0 silty clay to clay 7.20 25.9 12.0 0.318 2.65 0.0 silty clay to clay 7.20 25.9 12.0 0.318 2.65 0.0 silty clay to clay 7.20 25.9 12.0 0.318 2.65 0.0 silty clay to clay 7.20 25.9 12.0 0.318 2.65 0.0 silty clay to clay 7.20 25.9 12.0 0.318 2.65 0.0 silty clay to clay 7.20 25.9 12.0 0.318 2.65 0.0 silty clay to clay 7.20 25.9 12.0 0.318 2.65 0.0 silty clay to clay 7.20 25.9 12.0 0.318 2.65 0.0 silty clay to clay 7.20 25.9 12.0 0.318 2.65 0.0 silty clay to clay 7.20 25.9 12.0 0.318 2.65 0.0 silty clay to clay 7.20 25.9 12.0 0.318 2.65 0.0 silty clay to clay 7.20 25.9 12.0 0.318 2.65 0.0 silty							SOIL TYPE
4.70 15.4 4.3 6.266 4.77 0.6 clay 4.80 15.7 4.0 6.181 4.52 0.0 clay 4.90 16.1 5.2 6.214 4.15 0.6 clay 5.00 16.4 5.6 0.184 3.30 0.0 clay 5.00 16.7 5.4 0.158 2.97 0.0 clay 5.10 16.7 5.4 0.158 2.97 0.0 clay 5.20 17.1 6.1 0.174 2.67 0.0 clay 5.30 17.4 5.7 0.148 2.62 0.0 clay 5.40 17.7 5.3 6.156 2.97 0.0 clay 5.50 18.0 6.5 0.195 2.97 0.0 clay 5.50 18.4 4.6 0.162 3.56 0.0 clay 5.50 18.4 4.6 0.162 3.56 0.0 clay 5.80 19.0 3.8 0.095 2.90 0.0 clay 5.80 19.1 3.9 0.116 2.95 0.0 clay 5.80 19.1 4.3 0.135 3.13 0.0 clay 6.00 19.7 4.3 0.135 3.13 0.0 clay 6.00 19.7 4.3 0.135 3.13 0.0 clay 6.20 20.3 5.1 0.098 1.92 0.0 silty clay to clay 6.30 20.7 5.1 0.096 1.89 0.0 silty clay to clay 6.50 21.3 5.6 0.063 1.40 0.0 sensitive fine grained 6.60 21.7 6.2 0.090 1.45 0.0 silty clay to clay 6.80 22.3 6.9 0.187 2.77 0.0 silty clay to clay 6.90 22.6 5.4 0.177 3.27 0.0 silty clay to clay 6.90 22.6 5.4 0.177 3.27 0.0 silty clay to clay 7.00 23.0 5.5 0.154 2.77 0.0 silty clay to clay 7.00 23.0 5.5 0.154 2.77 0.0 silty clay to clay 7.00 23.0 5.5 0.154 2.77 0.0 silty clay to clay 7.00 23.0 5.5 0.154 2.77 0.0 silty clay to clay 7.00 23.0 5.5 0.154 2.77 0.0 silty clay to clay 7.00 23.0 5.5 0.154 2.77 0.0 silty clay to clay 7.00 23.0 5.5 0.154 2.77 0.0 silty clay to clay 7.00 23.0 5.5 0.154 2.77 0.0 silty clay to clay 7.00 23.0 5.5 0.154 2.77 0.0 silty clay to clay 7.00 23.0 5.5 0.154 2.77 0.0 silty clay to clay 7.00 23.0 5.5 0.154 2.77 0.0 silty clay to clay 7.00 23.0 5.5 0.154 2.77 0.0 silty clay to clay 7.00 23.0 5.5 0.154 2.77 0.0 silty clay to clay 7.00 23.0 5.5 0.154 2.77 0.0 silty clay to clay 7.00 23.0 5.5 0.154 2.77 0.0 silty clay to clay 7.00 23.0 5.5 0.154 2.77 0.0 silty clay to clay 7.00 23.0 5.5 0.154 2.77 0.0 silty clay to clay 7.00 25.9 10.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	#C(C) 3	1000	QU 10.				
4.80 15.7 4.0 0.181 4.52 0.0 clay 4.99 16.1 5.7 0.214 4.15 0.6 clay 5.00 16.4 5.6 0.184 3.30 0.0 clay 5.10 16.7 5.4 5.155 2.97 0.0 clay 5.20 17.1 6.1 6.174 2.57 0.0 clay 5.30 17.4 5.7 0.148 2.62 0.0 clay 5.40 17.7 5.3 0.555 2.97 0.0 clay 5.50 18.0 6.5 0.192 2.94 0.0 clay 5.50 18.0 6.5 0.192 2.94 0.0 clay 5.50 18.4 4.6 0.162 3.55 0.0 clay 5.70 18.7 3.9 0.115 2.95 0.0 clay 5.80 19.0 3.8 0.095 2.50 0.0 clay 5.90 19.4 3.9 0.121 3.13 0.0 clay 6.00 19.7 4.3 0.135 3.13 0.0 clay 6.10 20.0 4.2 0.100 2.40 0.0 clay 6.20 20.3 5.1 0.098 1.92 0.0 silty clay to clay 6.30 20.7 5.1 0.086 1.69 0.0 silty clay to clay 6.50 21.3 5.6 0.083 1.48 0.0 sensitive fine grained 6.60 21.7 6.2 0.090 1.45 0.0 sensitive fine grained 6.60 21.7 6.2 0.090 1.45 0.0 silty clay to clay 6.80 22.3 6.9 0.182 2.65 0.0 silty clay to clay 6.80 22.3 6.9 0.182 2.65 0.0 silty clay to clay 6.80 22.3 6.9 0.182 2.65 0.0 silty clay to clay 6.90 22.6 5.4 0.177 3.27 0.0 silty clay to clay 6.90 22.6 5.4 0.177 3.27 0.0 silty clay to clay 6.90 22.6 5.4 0.177 3.27 0.0 silty clay to clay 6.90 22.6 5.4 0.177 3.27 0.0 silty clay to clay 6.90 22.6 5.4 0.177 3.27 0.0 silty clay to clay 6.90 22.6 5.4 0.177 3.27 0.0 silty clay to clay 6.90 22.6 5.4 0.177 3.27 0.0 silty clay to clay 6.90 22.6 5.4 0.177 3.27 0.0 silty clay to clay 6.90 22.6 5.4 0.177 3.27 0.0 silty clay to clay 6.90 22.6 5.4 0.177 3.27 0.0 silty clay to clay 6.90 22.6 5.4 0.177 3.27 0.0 silty clay to clay 6.90 23.0 5.5 0.154 2.77 0.0 silty clay to clay 6.90 25.9 12.0 0.30 1.55 4.89 0.0 silty clay to clay 6.90 25.9 12.0 0.39 0.405 0.0 silty clay to clay 6.90 25.9 12.0 0.306 0.0 silty clay to clay 6.90 25.9 12.0 0.306 0.0 silty clay to clay 6.90 25.9 12.0 0.318 2.65 0.0 silty clay to clay 6.90 25.9 12.0 0.316 2.65 0.0 silty clay to clay 6.90 25.9 12.0 0.316 2.65 0.0 silty clay to clay 6.90 25.9 12.0 0.316 2.65 0.0 silty clay to clay 6.90 29.2 3.9 0.116 2.86 0.0 clay 6.90 29.5 4.2 0.155 3.71 0.0 clay 6.90 29.5 4.2 0.155 3.71 0.0 clay 6.90 29.5 4.2 0.155 3.71 0.0 clay 6.90 29.5 4.2 0.155 3.71 0.0 clay 6.90 29.5 4.	4.60	15.1	5.5	0.248	4.54	0.0	clay
4.90         16.1         5.7         0.214         4.15         0.6         clay           5.00         16.4         5.6         0.184         3.29         0.0         clay           5.10         16.7         5.4         0.155         2.97         0.0         clay           5.20         17.4         5.7         0.188         2.82         0.0         clay           5.30         17.4         5.7         0.188         2.82         0.0         clay           5.50         18.0         6.5         0.192         2.94         0.0         clay           5.50         18.4         4.6         0.162         3.56         0.0         clay           5.70         18.7         3.9         0.116         2.95         0.0         clay           5.80         19.4         3.9         0.121         3.13         0.0         clay           5.80         19.4         3.9         0.121         3.13         0.0         clay           6.00         19.7         4.3         0.138         3.13         0.0         clay           6.10         20.0         4.2         0.100         2.40         0.0	4.70	15.4	4.3	0.206	4.77	0.0	clay
4.90         16.1         5.7         0.214         4.15         0.6         clay           5.00         16.4         5.6         0.184         3.30         0.0         clay           5.20         17.1         5.4         0.155         2.97         0.0         clay           5.20         17.1         5.1         0.155         2.97         0.0         clay           5.30         17.4         5.7         0.148         2.52         0.0         clay           5.50         18.0         6.5         0.192         2.94         0.0         clay           5.50         18.0         6.5         0.192         2.95         0.0         clay           5.60         18.4         4.6         0.162         2.95         0.0         clay           5.80         19.0         3.8         0.095         2.50         0.0         clay           5.90         19.4         3.9         0.121         3.13         0.0         clay           6.00         19.7         4.3         0.138         3.13         0.0         clay           6.20         20.3         5.1         0.098         1.89         0.0	4.80			0.181	4.52	0.0	clay
\$1.00 16.4			5.2	4.214	4,15	9.0	clay
5.10         16.7         5.4         6.158         2.97         0.0         clay           5.20         17.1         6.1         6.174         2.67         0.0         clay           5.30         17.4         5.7         6.148         2.62         0.0         clay           5.40         17.7         5.3         6.152         2.97         0.0         clay           5.50         18.6         6.5         6.192         2.94         0.0         clay           5.60         18.4         4.6         0.162         3.56         0.0         clay           5.80         18.0         3.8         0.095         2.50         0.0         clay           5.80         19.0         3.8         0.095         2.50         0.0         clay           6.00         19.7         4.3         0.121         3.13         0.0         clay           6.00         19.7         4.3         0.135         3.13         0.0         clay           6.00         20.3         5.1         0.098         1.92         0.0         silty clay to clay           6.20         20.3         5.1         0.098         1.49         0.0 <td></td> <td></td> <td>5.6</td> <td>0.184</td> <td>3.30</td> <td>0.0</td> <td>clay</td>			5.6	0.184	3.30	0.0	clay
5.20         17.1         6.1         6.15a         2.87         0.0         clay           5.30         17.4         5.7         0.148         2.62         0.0         clay           5.40         17.7         5.3         0.158         2.97         0.0         clay           5.50         18.4         4.6         0.162         3.56         0.0         clay           5.70         18.7         3.8         0.116         2.95         0.0         clay           5.80         19.0         3.8         0.695         2.50         0.0         clay           5.80         19.0         3.8         0.695         2.50         0.0         clay           5.80         19.0         3.8         0.695         2.50         0.0         clay           6.00         19.7         4.3         0.135         3.13         0.0         clay           6.00         19.7         4.3         0.135         3.13         0.0         clay           6.10         20.3         5.1         0.098         1.92         0.0         silty clay to clay           6.20         20.3         5.1         0.098         1.69         0.0 <td></td> <td></td> <td></td> <td>9,159</td> <td>2.97</td> <td>0.0</td> <td>clay</td>				9,159	2.97	0.0	clay
5.30         17.4         5.7         0.188         2.82         0.0         clay           5.40         17.7         5.3         0.155         2.97         0.0         clay           5.50         18.6         6.5         0.192         2.94         0.0         clay           5.60         18.7         3.9         0.116         2.95         0.0         clay           5.80         18.0         3.8         0.095         2.50         0.0         clay           5.90         19.4         3.9         0.121         3.13         0.0         clay           6.00         19.7         4.3         0.135         3.13         0.0         clay           6.00         19.7         4.3         0.135         3.13         0.0         clay           6.00         1.7         4.3         0.135         3.13         0.0         clay           6.20         20.3         5.1         0.098         1.89         0.0         silty clay to clay           6.40         21.0         4.7         0.105         2.26         0.0         silty clay to clay           6.50         21.7         6.2         0.090         1.45				0.174		0,6	
5.40         17.7         5.3         0.155         2.97         0.0         clay           5.50         18.0         6.5         0.192         2.94         0.0         clay           5.60         18.4         4.6         0.162         3.56         0.0         clay           5.80         19.0         3.8         0.095         2.50         0.0         clay           5.90         19.4         3.9         0.121         3.13         0.0         clay           6.00         19.7         4.3         0.135         3.13         0.0         clay           6.10         20.0         4.2         0.100         2.40         0.0         clay           6.10         20.0         4.2         0.100         2.40         0.0         clay           6.20         20.3         5.1         0.098         1.92         0.0         silty clay to clay           6.20         20.3         5.1         0.098         1.89         0.0         silty clay to clay           6.50         21.3         5.6         0.089         1.45         0.0         sensitive fine grained           6.70         22.0         6.3         0.117         <			9.7	6.148		0.0	clay
5.50         18.0         6.5         0.192         2.94         0.0         clay           5.60         18.4         4.6         0.163         3.58         0.0         clay           5.70         18.7         3.9         0.116         2.95         0.0         clay           5.90         19.4         3.9         0.121         3.13         0.0         clay           6.00         19.7         4.3         0.135         3.13         0.0         clay           6.00         19.7         4.3         0.135         3.13         0.0         clay           6.10         20.0         4.2         0.100         2.40         0.0         clay           6.20         20.3         5.1         0.098         1.92         0.0         silty clay to clay           6.30         20.7         5.1         0.098         1.69         0.0         silty clay to clay           6.50         21.0         4.7         0.105         2.26         0.0         silty clay to clay           6.80         22.3         6.9         0.182         2.65         0.0         silty clay to clay           7.00         23.0         5.5         0.154				0.250		0.0	clay
5.60         18.4         4.6         6.167         3.5E         0.0         clay           5.70         18.7         3.8         6.11E         2.95         0.0         clay           5.80         19.0         3.8         0.085         2.50         0.0         clay           5.90         19.4         3.9         6.121         3.13         0.0         clay           6.10         20.0         4.2         0.103         2.40         0.0         clay           6.20         20.3         5.1         0.088         1.92         0.0         silty clay to clay           6.30         20.7         5.1         0.086         1.69         0.0         silty clay to clay           6.40         21.0         4.7         0.105         2.2E         0.0         silty clay to clay           6.50         21.3         5.6         0.083         1.48         0.0         sensitive fine grained           6.80         21.7         6.2         0.690         1.45         0.0         silty clay to clay           6.80         22.3         6.9         0.182         2.65         0.0         silty clay to clay           6.90         22.6 <td< td=""><td></td><td></td><td>€.5</td><td>0,192</td><td>2.94</td><td>0.0</td><td>clay</td></td<>			€.5	0,192	2.94	0.0	clay
5.70         18.7         3.9         6.11E         2.95         0.0         clay           5.80         19.0         3.8         0.635         2.50         0.0         clay           5.90         19.4         3.9         6.121         3.13         0.0         clay           6.00         19.7         4.3         0.135         3.13         0.0         clay           6.10         20.0         4.2         0.108         2.40         0.0         clay           6.20         20.3         5.1         0.088         1.92         0.0         silty clay to clay           6.30         20.7         5.1         0.096         1.69         0.0         silty clay to clay           6.50         21.3         5.6         0.093         1.48         0.0         sensitive fine grained           6.60         21.7         6.2         0.090         1.45         0.0         silty clay to clay           6.80         22.3         6.9         0.182         2.65         0.0         silty clay to clay           6.80         22.3         6.9         0.182         2.65         0.0         silty clay to clay           6.90         22.6 <td< td=""><td></td><td></td><td></td><td></td><td></td><td>0.0</td><td>clay</td></td<>						0.0	clay
5.80         19.0         3.8         0.095         2.50         0.0         clay           5.90         19.4         3.9         0.121         3.13         0.0         clay           6.00         19.7         4.3         0.135         3.13         0.0         clay           6.10         20.0         4.2         0.100         2.40         0.0         clay           6.20         20.3         5.1         0.098         1.92         0.0         silty clay to clay           6.30         20.7         5.1         0.086         1.69         0.0         silty clay to clay           6.40         21.0         4.7         0.105         2.26         0.0         silty clay to clay           6.50         21.3         5.6         0.083         1.48         0.0         sensitive fine grained           6.60         21.7         6.2         0.090         1.45         0.0         silty clay to clay           6.80         22.3         6.9         0.182         2.65         0.0         silty clay to clay           7.00         23.0         5.5         0.184         2.77         0.0         silty clay to clay           7.00         23.0 <td></td> <td></td> <td>3.9</td> <td>0.115</td> <td>2.95</td> <td>0.0</td> <td>clay</td>			3.9	0.115	2.95	0.0	clay
5.90         19.4         3.9         6.121         3.13         0.0         clay           6.00         19.7         4.3         0.135         3.13         0.0         clay           6.10         20.0         4.2         0.100         2.40         0.0         clay           6.20         20.3         5.1         0.098         1.92         0.0         silty clay to clay           6.30         20.7         5.1         0.096         1.69         0.0         silty clay to clay           6.40         21.0         4.7         0.105         2.26         0.0         silty clay to clay           6.50         21.3         5.6         0.083         1.48         0.0         sensitive fine grained           6.60         21.7         6.2         0.090         1.45         0.0         silty clay to clay           6.80         22.3         6.9         0.182         2.65         0.0         silty clay to clay           6.90         22.6         5.4         0.177         3.27         0.0         silty clay to clay           7.00         23.0         5.5         0.154         2.77         0.0         silty clay to clay           7.20			3.8	0.095		0.0	clay
6.00 19.7 4.3 0.135 3.13 0.0 clay 6.10 20.0 4.2 0.100 2.40 0.0 silty clay to clay 6.20 20.3 5.1 0.098 1.92 0.0 silty clay to clay 8.30 20.7 5.1 0.096 1.69 0.0 silty clay to clay 6.40 21.0 4.7 0.105 2.26 0.0 silty clay to clay 6.50 21.3 5.6 0.093 1.48 0.0 sensitive fine grained 6.60 21.7 6.2 0.090 1.45 0.0 sensitive fine grained 6.70 22.0 6.3 0.117 1.84 0.0 silty clay to clay 6.80 22.3 6.9 0.182 2.65 0.0 silty clay to clay 6.90 22.6 5.4 0.177 3.27 0.0 silty clay to clay 7.00 23.0 5.5 0.154 2.77 0.0 silty clay to clay 7.10 23.3 13.3 0.315 2.37 0.0 silty clay to clay 7.20 23.6 14.9 0.609 4.09 0.0 silty clay to clay 7.30 23.9 10.8 0.437 4.05 0.0 silty clay to clay 7.40 24.3 14.3 0.497 3.06 0.0 silty clay to clay 7.50 24.6 34.0 1.525 4.49 0.0 silty clay to clay 7.60 24.9 27.9 1.216 4.36 0.0 silty clay to clay 7.70 25.3 16.8 0.371 3.02 0.0 silty clay to clay 7.80 25.6 12.3 0.371 3.02 0.0 silty clay to clay 7.80 25.6 12.3 0.371 3.02 0.0 silty clay to clay 7.80 25.6 12.3 0.371 3.02 0.0 silty clay to clay 7.80 25.6 12.3 0.371 3.02 0.0 silty clay to clay 8.80 26.2 14.2 0.408 2.88 0.0 silty clay to clay 8.90 27.2 7.2 0.216 2.98 0.0 silty clay to clay 8.90 27.9 6.5 0.216 3.33 0.0 clay 8.90 28.2 4.8 0.126 2.98 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.2 3.9 0.112 2.99 0.0 clay 8.90 29.2 3.9 0.112 2.99 0.0 clay 8.90 29.2 3.9 0.112 2.99 0.0 clay 8.90 29.2 3.9 0.112 2.99 0.0 clay 8.90 29.2 3.9 0.112 2.99 0.0 clay 8.90 29.3 30.5 4.3 0.126 2.99 0.0 clay 8.90 29.3 30.5 4.3 0.126 2.99 0.0			3.9	0.121	3.13	0.0	clay
6.10 20.0 4.2 0.100 2.40 0.0 clay 6.20 20.3 5.1 0.098 1.92 0.0 silty clay to clay 6.30 20.7 5.1 0.086 1.69 0.0 silty clay to clay 6.40 21.0 4.7 0.105 2.26 0.0 silty clay to clay 6.50 21.3 5.6 0.083 1.48 0.0 sensitive fine grained 6.60 21.7 6.2 0.090 1.45 0.0 sensitive fine grained 6.60 22.0 6.3 0.117 1.84 0.0 silty clay to clay 6.80 22.3 6.9 0.182 2.65 0.0 silty clay to clay 6.80 22.3 6.9 0.182 2.65 0.0 silty clay to clay 6.90 22.6 5.4 0.177 3.27 0.0 silty clay to clay 7.00 23.0 5.5 0.154 2.77 0.0 silty clay to clay 7.10 23.3 13.3 0.315 2.37 0.0 silty clay to clay 7.20 23.6 14.9 0.609 4.09 0.6 silty clay to clay 7.20 23.6 14.9 0.609 4.09 0.6 silty clay to clay 7.30 23.9 10.8 0.437 4.05 6.0 clay 7.40 24.3 14.3 0.497 3.06 0.0 silty clay to clay 7.50 24.6 34.0 1.525 4.49 0.0 silty clay to clay 7.60 24.9 27.9 1.216 4.36 0.0 silty clay to clay 7.60 25.3 16.8 0.551 3.27 0.0 silty clay to clay 7.80 25.6 12.3 0.371 3.02 0.0 silty clay to clay 7.80 25.6 12.3 0.371 3.02 0.0 silty clay to clay 7.80 25.6 12.3 0.371 3.02 0.0 silty clay to clay 8.00 26.7 14.2 0.408 2.88 0.0 silty clay to clay 8.10 26.6 10.7 0.326 3.04 0.0 silty clay to clay 8.20 26.9 6.9 0.180 2.60 0.0 silty clay to clay 8.20 26.9 6.9 0.180 2.60 0.0 silty clay to clay 8.20 26.9 6.9 0.180 2.60 0.0 silty clay to clay 8.20 26.9 6.9 0.180 2.60 0.0 silty clay to clay 8.20 26.9 6.9 0.180 2.60 0.0 silty clay to clay 8.20 26.9 6.9 0.180 2.60 0.0 silty clay to clay 8.20 26.9 6.9 0.180 2.60 0.0 silty clay to clay 8.20 26.9 6.9 0.180 2.60 0.0 silty clay to clay 8.20 26.9 6.9 0.180 2.60 0.0 silty clay to clay 8.20 26.9 6.9 0.180 2.60 0.0 silty clay to clay 8.20 26.9 6.9 0.180 2.60 0.0 silty clay to clay 8.20 26.9 6.9 0.180 2.60 0.0 silty clay 8.20 26.9 6.9 0.180 2.60 0.0 silty clay 8.20 26.9 6.9 0.180 2.60 0.0 silty clay 8.20 27.9 6.5 0.216 3.33 0.0 clay 8.20 28.9 3.7 0.119 3.23 0.0 clay 8.20 29.9 4.4 0.149 3.20 0.0 clay 8.20 29.9 4.4 0.149 3.20 0.0 clay 8.20 29.9 4.4 0.149 3.20 0.0 clay 8.20 29.9 4.4 0.149 3.20 0.0 clay 9.20 30.2 5.0 0.125 2.49 0.0 clay 9.30 30.5 4.3 0				0.135	3.13	0.0	clay
6.20       20.3       5.1       0.098       1.92       0.0       silty clay to clay         6.30       20.7       5.1       0.096       1.69       0.0       silty clay to clay         6.40       21.0       4.7       0.105       2.26       0.0       silty clay to clay         6.50       21.3       5.6       0.083       1.48       0.0       sensitive fine grained         6.60       21.7       6.2       0.090       1.45       0.0       sensitive fine grained         6.70       22.0       6.3       0.117       1.84       0.0       silty clay to clay         6.80       22.3       6.9       0.182       2.65       0.0       silty clay to clay         6.90       22.6       5.4       0.177       3.27       0.0       silty clay to clay         7.00       23.0       5.5       0.154       2.77       0.0       silty clay to clay         7.10       23.3       13.3       0.315       2.37       0.0       silty clay to clay         7.20       23.6       14.9       0.609       4.09       0.0       silty clay to clay         7.30       23.9       10.8       0.437       4.05       0.0				0.100	2.40	0.0	clay
6.30 20.7 5.1 0.086 1.69 0.0 silty clay to clay 6.40 21.0 4.7 0.105 2.26 0.0 silty clay to clay 6.50 21.3 5.6 0.083 1.48 0.0 sensitive fine grained 6.60 21.7 6.2 0.090 1.45 0.0 sensitive fine grained 6.70 22.0 6.3 0.117 1.84 0.0 silty clay to clay 6.80 22.3 6.9 0.182 2.65 0.0 silty clay to clay 6.90 22.6 5.4 0.177 3.27 0.0 clay 7.00 23.0 5.5 0.154 2.77 0.0 silty clay to clay 7.10 23.3 13.3 0.315 2.37 0.0 silty clay to clay 7.20 23.6 14.9 0.609 4.09 0.0 silty clay to clay 7.30 23.9 10.8 0.437 4.05 0.0 clay 7.40 24.3 14.3 0.437 3.06 0.0 silty clay to clay 7.50 24.6 34.0 1.525 4.49 0.0 silty clay to clay 7.60 24.9 27.9 1.216 4.36 0.0 silty clay to clay 7.80 25.6 12.3 0.371 3.02 0.0 silty clay to clay 7.90 25.9 12.0 0.318 2.65 0.0 silty clay to clay 8.00 26.2 14.2 0.408 2.88 0.0 silty clay to clay 8.20 26.9 6.9 0.180 2.60 0.0 silty clay to clay 8.20 26.9 6.9 0.180 2.60 0.0 silty clay to clay 8.20 26.9 6.9 0.180 2.60 0.0 silty clay to clay 8.20 26.9 6.9 0.180 2.60 0.0 silty clay to clay 8.20 26.9 6.9 0.180 2.60 0.0 silty clay to clay 8.20 26.9 6.9 0.180 2.60 0.0 silty clay to clay 8.20 26.9 6.9 0.180 2.60 0.0 silty clay to clay 8.20 27.2 7.2 0.216 2.98 0.0 clay 8.30 27.2 7.2 0.216 2.98 0.0 clay 8.50 27.9 6.5 0.216 3.33 0.0 clay 8.50 27.9 6.5 0.216 3.33 0.0 clay 8.50 28.2 4.8 0.126 2.64 0.0 clay 8.50 28.2 4.8 0.126 2.64 0.0 clay 8.50 28.2 4.8 0.126 2.64 0.0 clay 8.50 28.2 4.8 0.126 2.64 0.0 clay 8.50 28.2 3.9 0.111 2.86 0.0 clay 8.50 29.2 3.9 0.111 2.86 0.0 clay 8.50 29.2 3.9 0.111 2.86 0.0 clay 8.50 29.2 3.9 0.111 2.86 0.0 clay 8.50 29.5 4.2 0.155 3.71 0.0 clay 8.50 29.5 4.2 0.155 3.71 0.0 clay 8.50 29.5 4.2 0.155 3.71 0.0 clay 8.50 29.5 4.2 0.155 3.71 0.0 clay 8.50 29.5 4.2 0.155 3.71 0.0 clay 8.50 29.5 4.2 0.155 3.71 0.0 clay 8.50 29.5 4.2 0.155 3.71 0.0 clay 8.50 29.5 4.2 0.155 3.71 0.0 clay 8.50 29.5 4.2 0.155 3.71 0.0 clay 8.50 29.5 4.2 0.155 3.71 0.0 clay 8.50 29.5 4.2 0.155 3.71 0.0 clay 8.50 29.5 4.2 0.155 3.71 0.0 clay 8.50 29.5 4.2 0.155 3.71 0.0 clay 8.50 29.5 4.3 0.126 2.94 0.0 clay 8.50 29.5 4.3 0.126 2				0.098	1.92	0.0	silty clay to clay
6.40 21.0 4.7 0.105 2.26 0.0 silty clay to clay 6.50 21.3 5.6 0.083 1.48 0.0 sensitive fine grained 6.60 21.7 6.2 0.090 1.45 0.0 sensitive fine grained 6.70 22.0 6.3 0.117 1.94 0.0 silty clay to clay 6.80 22.3 6.9 0.182 2.65 0.0 silty clay to clay 6.90 22.6 5.4 0.177 3.27 0.0 clay 7.00 23.0 5.5 0.154 2.77 0.0 silty clay to clay 7.10 23.3 13.3 0.315 2.37 0.0 silty clay to clay 7.20 23.6 14.9 0.609 4.09 0.0 silty clay to clay 7.30 23.9 10.8 0.437 4.05 0.0 clay 7.40 24.3 14.3 0.437 4.05 0.0 silty clay to clay 7.50 24.6 34.0 1.525 4.49 0.0 silty clay to clay 7.60 24.9 27.9 1.216 4.36 0.0 silty clay to clay 7.80 25.6 12.3 0.371 3.02 0.0 silty clay to clay 7.90 25.9 12.0 0.318 2.65 0.0 silty clay to clay 7.90 25.9 12.0 0.318 2.65 0.0 silty clay to clay 8.00 26.2 14.2 0.408 2.88 0.0 silty clay to clay 8.20 26.9 6.9 0.180 2.60 0.0 silty clay to clay 8.30 27.2 7.2 0.216 2.98 0.0 clay 8.40 27.5 0.246 0.0 clay 8.50 27.9 6.5 0.226 3.49 0.0 clay 8.50 27.9 6.5 0.216 3.33 0.0 clay 8.50 27.9 6.5 0.216 3.33 0.0 clay 8.50 27.9 6.5 0.216 3.33 0.0 clay 8.50 27.9 6.5 0.216 3.33 0.0 clay 8.50 27.9 6.5 0.216 3.33 0.0 clay 8.50 27.9 6.5 0.216 3.33 0.0 clay 8.50 28.2 4.8 0.126 2.64 0.0 clay 8.50 28.2 4.8 0.126 2.64 0.0 clay 8.50 28.2 4.8 0.126 2.64 0.0 clay 8.50 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.5 4.2 0.155 3.71 0.0 clay 8.90 29.5 4				0.086		0.0	silty clay to clay
6.50 21.3 5.6 0.083 1.48 0.0 sensitive fine grained 6.60 21.7 6.2 0.090 1.45 0.0 sensitive fine grained 6.70 22.0 6.3 0.117 1.84 0.0 silty clay to clay 6.80 22.3 6.9 0.182 2.65 0.0 silty clay to clay 6.90 22.6 5.4 0.177 3.27 0.0 clay 7.00 23.0 5.5 0.154 2.77 0.0 silty clay to clay 7.10 23.3 13.3 0.315 2.37 0.0 silty clay to clay 7.20 23.6 14.9 0.609 4.09 0.0 silty clay to clay 7.20 23.6 14.9 0.609 4.09 0.0 silty clay to clay 7.30 23.9 10.8 0.437 4.05 0.0 clay 7.40 24.3 14.3 0.437 3.06 0.0 silty clay to clay 7.50 24.6 34.0 1.525 4.49 0.0 silty clay to clay 7.60 24.9 27.9 1.216 4.36 0.0 silty clay to clay 7.70 25.3 16.8 0.551 3.27 0.0 silty clay to clay 7.80 25.6 12.3 0.371 3.02 0.0 silty clay to clay 7.90 25.9 12.0 0.318 2.65 0.0 silty clay to clay 8.00 26.2 14.2 0.408 2.88 0.0 silty clay to clay 8.10 26.6 10.7 0.326 3.04 0.0 silty clay to clay 8.20 26.9 6.9 0.180 2.60 0.0 silty clay to clay 8.30 27.2 7.2 0.216 2.98 0.0 clay 8.40 27.6 7.0 0.245 3.49 0.0 clay 8.50 27.9 6.5 0.216 3.33 0.0 clay 8.60 28.2 4.8 0.126 2.84 0.0 clay 8.60 28.2 4.8 0.126 2.64 0.0 clay 8.60 28.2 4.8 0.126 2.64 0.0 clay 8.60 28.9 3.7 0.119 3.23 0.0 clay 8.60 28.9 3.7 0.119 3.23 0.0 clay 8.60 28.9 3.7 0.119 3.23 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.5 4.2 0.155 3.71 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.8 5.3 0.152 2.88 0.0 clay 9.30 30.8 5.3 0.152 2.88 0.0 0.0 clay 9.30 30.8 5.3 0.				0.105	2.26	0.0	silty clay to clay
6.60 21.7 6.2 0.090 1.45 0.0 sensitive fine grained 6.70 22.0 6.3 0.117 1.84 0.0 silty clay to clay 6.80 22.3 6.9 0.182 2.65 0.0 silty clay to clay 6.90 22.6 5.4 0.177 3.27 0.0 clay 7.00 23.0 5.5 0.154 2.77 0.0 silty clay to clay 7.10 23.3 13.3 0.315 2.37 0.0 silty clay to clay 7.20 23.6 14.9 0.609 4.09 0.0 silty clay to clay 7.30 23.9 10.8 0.437 4.05 0.0 clay 7.40 24.3 14.3 0.437 3.06 0.0 silty clay to clay 7.50 24.6 34.0 1.525 4.49 0.0 silty clay to clay 7.70 25.3 16.8 0.551 3.27 0.0 silty clay to clay 7.70 25.3 16.8 0.551 3.27 0.0 silty clay to clay 7.80 25.6 12.3 0.371 3.02 0.0 silty clay to clay 7.90 25.9 12.0 0.318 2.65 0.0 silty clay to clay 8.00 26.2 14.2 0.408 2.88 0.0 silty clay to clay 8.10 26.6 10.7 0.326 3.04 0.0 silty clay to clay 8.30 27.2 7.2 0.216 2.98 0.0 clay 8.40 27.6 7.0 0.245 3.49 0.0 clay 8.50 27.9 6.5 0.216 3.33 0.0 clay 8.50 27.9 6.5 0.216 3.33 0.0 clay 8.50 27.9 6.5 0.216 3.33 0.0 clay 8.50 28.2 4.8 0.126 2.84 0.0 clay 8.50 28.2 4.8 0.126 2.84 0.0 clay 8.50 28.2 4.8 0.126 2.84 0.0 clay 8.50 28.9 3.7 0.119 3.23 0.0 clay 8.50 29.2 3.9 0.111 2.86 0.0 clay 8.50 29.5 4.2 0.155 3.71 0.0 clay 8.50 29.5 4.2 0.155 3.71 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay		21.3	5.6	0.083	1.48	0.0	sensitive fine grained
6.80 22.3 6.9 0.182 2.65 0.0 silty clay to clay 6.90 22.6 5.4 0.177 3.27 0.0 clay 7.00 23.0 5.5 0.154 2.77 0.0 silty clay to clay 7.10 23.3 13.3 0.315 2.37 0.0 silty clay to clay 7.20 23.6 14.9 0.609 4.09 0.0 silty clay to clay 7.30 23.9 10.8 0.437 4.05 0.0 clay 7.40 24.3 14.3 0.437 3.06 0.0 silty clay to clay 7.50 24.6 34.0 1.525 4.45 0.0 silty clay to clay 7.60 24.9 27.9 1.216 4.36 0.0 silty clay to clay 7.70 25.3 16.8 0.551 3.27 0.0 silty clay to clay 7.80 25.6 12.3 0.371 3.02 0.0 silty clay to clay 7.90 25.9 12.0 0.318 2.65 0.0 silty clay to clay 8.00 26.2 14.2 0.408 2.86 0.0 silty clay to clay 8.10 26.6 10.7 0.326 3.04 0.0 silty clay to clay 8.20 26.9 6.9 0.180 2.60 0.0 silty clay to clay 8.30 27.2 7.2 0.216 2.98 0.0 clay 8.40 27.6 7.0 0.245 3.49 0.0 clay 8.50 27.9 6.5 0.216 3.33 0.0 clay 8.60 28.2 4.8 0.126 2.64 0.0 clay 8.70 28.5 3.7 0.105 2.84 0.0 clay 8.80 28.9 3.7 0.119 3.23 0.0 clay 8.80 28.9 3.7 0.119 3.23 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.2 5.0 0.125 2.49 0.0 clay 8.90 29.5 4.2 0.155 3.71 0.0 clay 8.90 29.9 4.4 0.149 3.40 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay	6.60	21.7	6.2	0.090	1.45	0.0	sensitive fine grained
6.90 22.6 5.4 0.177 3.27 0.0 clay 7.00 23.0 5.5 0.154 2.77 0.0 silty clay to clay 7.10 23.3 13.3 0.315 2.37 0.0 silty clay to clay 7.20 23.6 14.9 0.609 4.09 0.0 silty clay to clay 7.30 23.9 10.8 0.437 4.05 0.0 clay 7.40 24.3 14.3 0.437 3.06 0.0 silty clay to clay 7.50 24.6 34.0 1.525 4.49 0.0 silty clay to clay 7.60 24.9 27.9 1.216 4.36 0.0 silty clay to clay 7.70 25.3 16.8 0.551 3.27 0.0 silty clay to clay 7.80 25.6 12.3 0.371 3.02 0.0 silty clay to clay 7.80 25.9 12.0 0.318 2.65 0.0 silty clay to clay 8.00 26.7 14.2 0.408 2.88 0.0 silty clay to clay 8.10 26.6 10.7 0.326 3.04 0.0 silty clay to clay 8.20 26.9 6.9 0.180 2.60 0.0 silty clay to clay 8.30 27.2 7.2 0.216 2.98 0.0 clay 8.40 27.6 7.0 0.245 3.49 0.0 clay 8.50 27.9 6.5 0.216 3.33 0.0 clay 8.60 28.2 4.8 0.126 2.64 0.0 clay 8.70 28.5 3.7 0.105 2.84 0.0 clay 8.80 28.9 3.7 0.119 3.23 0.0 clay 8.80 28.9 3.7 0.119 3.23 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.2 5.0 0.125 2.49 0.0 clay 8.90 29.2 5.0 0.125 2.49 0.0 clay 8.90 29.9 4.4 0.149 3.40 0.0 clay 8.90 29.9 4.4 0.149 3.40 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay	6.70	22.0	6.3	0.117	1.84	0.0	silty clay to clay
7.00 23.0 5.5 0.154 2.77 0.0 silty clay to clay 7.10 23.3 13.3 0.315 2.37 0.0 silty clay to clay 7.20 23.6 14.9 0.609 4.09 0.0 silty clay to clay 7.30 23.9 10.8 0.437 4.05 0.0 clay 7.40 24.3 14.3 0.437 3.06 0.0 silty clay to clay 7.50 24.6 34.0 1.525 4.49 0.0 silty clay to clay 7.60 24.9 27.9 1.216 4.36 0.0 silty clay to clay 7.70 25.3 16.8 0.551 3.27 0.0 silty clay to clay 7.80 25.6 12.3 0.371 3.02 0.0 silty clay to clay 7.90 25.9 12.0 0.318 2.65 0.0 silty clay to clay 8.00 26.2 14.2 0.408 2.88 0.0 silty clay to clay 8.10 26.6 10.7 0.326 3.04 0.0 silty clay to clay 8.30 27.2 7.2 0.216 2.98 0.0 clay 8.40 27.6 7.0 0.245 3.49 0.0 clay 8.40 27.6 7.0 0.245 3.49 0.0 clay 8.50 27.9 6.5 0.216 3.33 0.0 clay 8.60 28.2 4.8 0.126 2.64 0.0 clay 8.70 28.5 3.7 0.119 3.23 0.0 clay 8.80 28.9 3.7 0.119 3.23 0.0 clay 8.80 28.9 3.7 0.119 3.23 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.5 4.2 0.155 3.71 0.0 clay 9.30 27.5 5.0 0.125 2.49 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4	6.80	22.3	6.9	0.182	2.65	0.0	silty clay to clay
7.10 23.3 13.3 0.315 2.37 0.0 silty clay to clay 7.20 23.6 14.9 0.609 4.09 0.0 silty clay to clay 7.30 23.9 10.8 0.437 4.05 0.0 clay 7.40 24.3 14.3 0.437 3.06 0.0 silty clay to clay 7.50 24.6 34.0 1.525 4.49 0.0 silty clay to clay 7.60 24.9 27.9 1.216 4.36 0.0 silty clay to clay 7.70 25.3 16.8 0.551 3.27 0.0 silty clay to clay 7.80 25.6 12.3 0.371 3.02 0.0 silty clay to clay 7.90 25.9 12.0 0.318 2.65 0.0 silty clay to clay 8.00 26.7 14.2 0.408 2.88 0.0 silty clay to clay 8.10 26.6 10.7 0.326 3.04 0.0 silty clay to clay 8.20 26.9 6.9 0.180 2.60 0.0 silty clay to clay 8.30 27.2 7.2 0.216 2.98 0.0 silty clay to clay 8.40 27.6 7.0 0.245 3.49 0.0 clay 8.50 27.9 6.5 0.216 3.33 0.0 clay 8.60 28.2 4.8 0.126 2.84 0.0 clay 8.70 28.5 3.7 0.106 2.84 0.0 clay 8.80 28.9 3.7 0.119 3.23 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.5 4.2 0.155 3.71 0.0 clay 8.90 29.9 4.4 0.149 3.40 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay 8.90 29.9 5.0 0.125 2.49 0.0 clay 8.90 29.9 5.3 0.152 2.88 0.0 clay	6.90	22.6	5.4	0.177	3.27	0.0	clay
7.20       23.6       14.9       0.609       4.09       0.0       silty clay to clay         7.30       23.9       10.8       0.437       4.05       0.0       clay         7.40       24.3       14.3       0.437       3.06       0.0       silty clay to clay         7.50       24.6       34.0       1.525       4.49       0.0       silty clay to clay         7.60       24.9       27.9       1.216       4.36       0.0       silty clay to clay         7.70       25.3       16.8       0.551       3.27       0.0       silty clay to clay         7.80       25.6       12.3       0.371       3.02       0.0       silty clay to clay         7.90       25.9       12.0       0.318       2.65       0.0       silty clay to clay         8.00       26.2       14.2       0.408       2.88       0.0       silty clay to clay         8.10       26.6       10.7       0.326       3.04       0.0       silty clay to clay         8.20       26.9       6.9       0.180       2.60       0.0       silty clay to clay         8.30       27.2       7.2       0.216       2.99       0.0       clay <td>7.00</td> <td>23.0</td> <td>5.5</td> <td>0.154</td> <td>2.77</td> <td>0.0</td> <td>silty clay to clay</td>	7.00	23.0	5.5	0.154	2.77	0.0	silty clay to clay
7.30 23.9 10.8 0.437 4.05 0.0 clay 7.40 24.3 14.3 0.437 3.06 0.0 silty clay to clay 7.50 24.6 34.0 1.525 4.49 0.0 silty clay to clay 7.50 24.9 27.9 1.216 4.36 0.0 silty clay to clay 7.70 25.3 16.8 0.551 3.27 0.0 silty clay to clay 7.80 25.6 12.3 0.371 3.02 0.0 silty clay to clay 7.90 25.9 12.0 0.318 2.65 0.0 silty clay to clay 8.00 26.2 14.2 0.408 2.88 0.0 silty clay to clay 8.10 26.6 10.7 0.326 3.04 0.0 silty clay to clay 8.20 26.9 6.9 0.180 2.60 0.0 silty clay to clay 8.30 27.2 7.2 0.216 2.98 0.0 clay 8.40 27.6 7.0 0.245 3.49 0.0 clay 8.50 27.9 6.5 0.216 3.33 0.0 clay 8.60 28.2 4.8 0.126 2.64 0.0 clay 8.70 28.5 3.7 0.106 2.84 0.0 clay 8.80 28.9 3.7 0.119 3.23 0.0 clay 8.80 28.9 3.7 0.119 3.23 0.0 clay 8.90 29.2 3.9 0.11 2.86 0.0 clay 8.90 29.2 3.9 0.11 2.86 0.0 clay 8.90 29.2 3.9 0.11 2.86 0.0 clay 8.90 29.2 3.9 0.11 2.86 0.0 clay 8.90 29.2 5.0 0.125 2.49 0.0 clay 9.20 30.2 5.0 0.125 2.49 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.40 30.8 5.3 0.152 2.88 0.0 clay	7.10	23.3	13.3	0.315	2.37	0.0	silty clay to clay
7.40 24.3 14.3 0.437 3.06 0.0 silty clay to clay 7.50 24.6 34.0 1.525 4.49 0.0 silty clay to clay 7.60 24.9 27.9 1.215 4.36 0.0 silty clay to clay 7.70 25.3 16.8 0.551 3.27 0.0 silty clay to clay 7.80 25.6 12.3 0.371 3.02 0.0 silty clay to clay 7.90 25.9 12.0 0.318 2.65 0.0 silty clay to clay 8.00 26.2 14.2 0.408 2.86 0.0 silty clay to clay 8.10 26.6 10.7 0.326 3.04 0.0 silty clay to clay 8.20 26.9 6.9 0.180 2.60 0.0 silty clay to clay 8.30 27.2 7.2 0.216 2.98 0.0 clay 8.40 27.6 7.0 0.245 3.49 0.0 clay 8.50 27.9 6.5 0.216 3.33 0.0 clay 8.60 28.2 4.8 0.126 2.64 0.0 clay 8.70 28.5 3.7 0.105 2.84 0.0 clay 8.80 28.9 3.7 0.119 3.23 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 9.00 29.5 4.2 0.155 3.71 0.0 clay 9.20 30.2 5.0 0.125 2.49 0.0 clay 9.30 30.5 4.3 0.126 2.49 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 5.3 0.152 2.88 0.0 clay 9.40 20.8 5.3 0.152 2.88 0.0 clay	7.20	23.6	14.9	0.609	4.09	0.0	silty clay to clay
7.50 24.6 34.0 1.525 4.49 0.0 silty clay to clay 7.60 24.9 27.9 1.216 4.36 0.0 silty clay to clay 7.70 25.3 16.8 0.551 3.27 0.0 silty clay to clay 7.80 25.6 12.3 0.371 3.02 0.0 silty clay to clay 7.90 25.9 12.0 0.318 2.65 0.0 silty clay to clay 8.00 26.7 14.2 0.408 2.88 0.0 silty clay to clay 8.10 26.6 10.7 0.326 3.04 0.0 silty clay to clay 8.20 26.9 6.9 0.180 2.60 0.0 silty clay to clay 8.30 27.2 7.2 0.216 2.98 0.0 clay 8.40 27.6 7.0 0.245 3.49 0.0 clay 8.50 27.9 6.5 0.216 3.33 0.0 clay 8.60 28.2 4.8 0.126 2.64 0.0 clay 8.70 28.5 3.7 0.115 2.84 0.0 clay 8.70 28.5 3.7 0.119 3.23 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 9.00 29.5 4.2 0.155 3.71 0.0 clay 9.20 30.2 5.0 0.125 2.49 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 5.3 0.152 2.88 0.0 clay 9.30	7.30	23.9	10.8	0.437	4.05	0.0	clay
7.60 24.9 27.9 1.216 4.36 0.0 silty clay to clay 7.70 25.3 16.8 0.551 3.27 0.0 silty clay to clay 7.80 25.6 12.3 0.371 3.02 0.0 silty clay to clay 7.80 25.8 12.0 0.318 2.65 0.0 silty clay to clay 8.00 26.2 14.2 0.408 2.88 0.0 silty clay to clay 8.10 26.6 10.7 0.326 3.04 0.0 silty clay to clay 8.20 26.9 6.9 0.180 2.60 0.0 silty clay to clay 8.30 27.2 7.2 0.216 2.98 0.0 clay 8.40 27.6 7.0 0.245 3.49 0.0 clay 8.50 27.9 6.5 0.216 3.33 0.0 clay 8.60 28.2 4.8 0.126 2.64 0.0 clay 8.70 28.5 3.7 0.106 2.84 0.0 clay 8.70 28.5 3.7 0.106 2.84 0.0 clay 8.80 28.9 3.7 0.119 3.23 0.0 clay 8.80 28.9 3.7 0.119 3.23 0.0 clay 8.90 29.2 3.9 0.11 2.86 0.0 clay 8.90 29.2 3.9 0.11 2.86 0.0 clay 9.00 29.5 4.2 0.155 3.71 0.0 clay 9.10 29.9 4.4 0.149 3.40 0.0 clay 9.20 30.2 5.0 0.125 2.49 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.40 30.8 5.3 0.152 2.88 0.0 clay	7.40	24.3	14.3	0.437	3.06	0.0	silty clay to clay
7.70 25.3 16.8 0.551 3.27 0.0 silty clay to clay 7.80 25.6 12.3 0.371 3.02 0.0 silty clay to clay 7.90 25.9 12.0 0.318 2.65 0.0 silty clay to clay 8.00 26.2 14.2 0.408 2.88 0.0 silty clay to clay 8.10 26.6 10.7 0.326 3.04 0.0 silty clay to clay 8.20 26.9 6.9 0.180 2.60 0.0 silty clay to clay 8.30 27.2 7.2 0.216 2.98 0.0 clay 8.40 27.6 7.0 0.245 3.49 0.0 clay 8.50 27.9 6.5 0.216 3.33 0.0 clay 8.60 28.2 4.8 0.126 2.64 0.0 clay 8.70 28.5 3.7 0.106 2.84 0.0 clay 8.70 28.5 3.7 0.106 2.84 0.0 clay 8.80 28.9 3.7 0.119 3.23 0.0 clay 8.80 28.9 3.7 0.119 3.23 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.2 3.9 0.11 2.86 0.0 clay 9.00 29.5 4.2 0.155 3.71 0.0 clay 9.10 29.9 4.4 0.149 3.40 0.0 clay 9.20 30.2 5.0 0.125 2.49 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.40 30.8 5.3 0.152 2.88 0.0 clay	7.50	24.6	34.0	1.525	4.45	0.0	silty clay to clay
7.80 25.6 12.3 0.371 3.02 0.0 silty clay to clay 7.90 25.9 12.0 0.318 2.65 0.0 silty clay to clay 8.00 26.7 14.2 0.408 2.88 0.0 silty clay to clay 8.10 26.6 10.7 0.326 3.04 0.0 silty clay to clay 8.20 26.9 6.9 0.180 2.60 0.0 silty clay to clay 8.30 27.2 7.2 0.216 2.98 0.0 clay 8.40 27.6 7.0 0.245 3.49 0.0 clay 8.50 27.9 6.5 0.216 3.33 0.0 clay 8.60 28.2 4.8 0.126 2.64 0.0 clay 8.70 28.5 3.7 0.106 2.84 0.0 clay 8.70 28.5 3.7 0.119 3.23 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 9.00 29.5 4.2 0.155 3.71 0.0 clay 9.10 29.9 4.4 0.149 3.40 0.0 clay 9.20 30.2 5.0 0.125 2.49 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.40 30.8 5.3 0.152 2.88 0.0 clay 9.30	7.60		27.9	1.215	4.3E	0.0	silty clay to clay
7.90       25.9       12.0       0.318       2.65       0.0       silty clay to clay         8.00       26.2       14.2       0.408       2.88       0.0       silty clay to clay         8.10       26.6       10.7       0.326       3.04       0.0       silty clay to clay         8.20       26.9       6.9       0.180       2.60       0.0       silty clay to clay         8.30       27.2       7.2       0.216       2.98       0.0       clay         8.40       27.6       7.0       0.245       3.49       0.0       clay         8.50       27.9       6.5       0.216       3.33       0.0       clay         8.60       28.2       4.8       0.126       2.64       0.0       clay         8.70       28.5       3.7       0.106       2.84       0.0       clay         8.80       28.9       3.7       0.119       3.23       0.0       clay         8.90       29.2       3.9       0.111       2.86       0.0       clay         9.00       29.5       4.2       0.155       3.71       0.0       clay         9.10       29.9       4.4       0	7.70	<b>25.</b> 3	16.8	0.551	3.27	0.0	silty clay to clay
8.00       26.7       14.2       0.408       2.88       0.0       silty clay to clay         8.10       26.6       10.7       0.326       3.04       0.0       silty clay to clay         8.20       26.9       6.9       0.180       2.60       0.0       silty clay to clay         8.30       27.2       7.2       0.216       2.98       0.0       clay         8.40       27.6       7.0       0.245       3.49       0.0       clay         8.50       27.9       6.5       0.216       3.33       0.0       clay         8.60       28.2       4.8       0.126       2.64       0.0       clay         8.70       28.5       3.7       0.106       2.84       0.0       clay         8.80       28.9       3.7       0.119       3.23       0.0       clay         8.90       29.2       3.9       0.111       2.86       0.0       clay         9.00       29.5       4.2       0.155       3.71       0.0       clay         9.10       29.9       4.4       0.149       3.40       0.0       clay         9.20       30.2       5.0       0.125	7.80		12.3	0.371		0.0	silty clay to clay
8.10       26.6       10.7       0.326       3.04       0.0       silty clay to clay         8.20       26.9       6.9       0.180       2.60       0.0       silty clay to clay         8.30       27.2       7.2       0.216       2.98       0.0       clay         8.40       27.6       7.0       0.245       3.49       0.0       clay         8.50       27.9       6.5       0.216       3.33       0.0       clay         8.60       28.2       4.8       0.126       2.64       0.0       clay         8.70       28.5       3.7       0.106       2.84       0.0       clay         8.80       28.9       3.7       0.119       3.23       0.0       clay         8.90       29.2       3.9       0.111       2.86       0.0       clay         9.00       29.5       4.2       0.155       3.71       0.0       clay         9.10       29.9       4.4       0.149       3.40       0.0       clay         9.20       30.2       5.0       0.125       2.49       0.0       clay         9.30       30.5       4.3       0.126       2.94	7.90	25.9	12.0	0.318	2.65	0.0	
8.20       26.9       6.9       0.180       2.60       0.0       silty clay to clay         8.30       27.2       7.2       0.216       2.98       0.0       clay         8.40       27.6       7.0       0.245       3.49       0.0       clay         8.50       27.9       6.5       0.216       3.33       0.0       clay         8.60       28.2       4.8       0.126       2.64       0.0       clay         8.70       28.5       3.7       0.106       2.84       0.0       clay         8.80       28.9       3.7       0.119       3.23       0.0       clay         8.90       29.2       3.9       0.111       2.86       0.0       clay         9.00       29.5       4.2       0.155       3.71       0.0       clay         9.10       29.9       4.4       0.149       3.40       0.0       clay         9.20       30.2       5.0       0.125       2.49       0.0       clay         9.30       30.5       4.3       0.126       2.94       0.0       clay         9.40       30.8       5.3       0.152       2.88       0.0 </td <td>8.00</td> <td>26.2</td> <td>14.2</td> <td>0.408</td> <td>2.88</td> <td>0.0</td> <td></td>	8.00	26.2	14.2	0.408	2.88	0.0	
8.30       27.2       7.2       0.216       2.98       0.0       clay         8.40       27.6       7.0       0.245       3.49       0.0       clay         8.50       27.9       6.5       0.216       3.33       0.0       clay         8.60       28.2       4.8       0.126       2.64       0.0       clay         8.70       28.5       3.7       0.106       2.84       0.0       clay         8.80       28.9       3.7       0.119       3.23       0.0       clay         8.90       29.2       3.9       0.111       2.86       0.0       clay         9.00       29.5       4.2       0.155       3.71       0.0       clay         9.10       29.9       4.4       0.149       3.40       0.0       clay         9.20       30.2       5.0       0.125       2.49       0.0       clay         9.30       30.5       4.3       0.126       2.94       0.0       clay         9.40       30.8       5.3       0.152       2.88       0.0       clay	8.10	26.€	10.7	0.325	3.04		
8.40 27.6 7.0 0.245 3.49 0.0 clay 8.50 27.9 6.5 0.216 3.33 0.0 clay 8.60 28.2 4.8 0.126 2.64 0.0 clay 8.70 28.5 3.7 0.106 2.84 0.0 clay 8.80 28.9 3.7 0.119 3.23 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 9.00 29.5 4.2 0.155 3.71 0.0 clay 9.10 29.9 4.4 0.149 3.40 0.0 clay 9.20 30.2 5.0 0.125 2.49 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.40 30.8 5.3 0.152 2.88 0.0 clay	8.20	26.9	6.9	0.180		0.0	silty clay to clay
8.50 27.9 6.5 0.218 3.33 0.0 clay 8.60 28.2 4.8 0.126 2.64 0.0 clay 8.70 28.5 3.7 0.106 2.84 0.0 clay 8.80 28.9 3.7 0.119 3.23 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 9.00 29.5 4.2 0.155 3.71 0.0 clay 9.10 29.9 4.4 0.149 3.40 0.0 clay 9.20 30.2 5.0 0.125 2.49 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.40 30.8 5.3 0.152 2.88 0.0 clay	8.30	27.2	7.2	0.216	2.98		•
8.60       28.2       4.8       0.126       2.64       0.0       clay         8.70       28.5       3.7       0.106       2.84       0.0       clay         8.80       28.9       3.7       0.119       3.23       0.0       clay         8.90       29.2       3.9       0.111       2.86       0.0       clay         9.00       29.5       4.2       0.155       3.71       0.0       clay         9.10       29.9       4.4       0.149       3.40       0.0       clay         9.20       30.2       5.0       0.125       2.49       0.0       clay         9.30       30.5       4.3       0.126       2.94       0.0       clay         9.40       30.8       5.3       0.152       2.88       0.0       clay	8.40						
8.70 28.5 3.7 0.106 2.84 0.0 clay 8.80 28.9 3.7 0.119 3.23 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 9.00 29.5 4.2 0.155 3.71 0.0 clay 9.10 29.9 4.4 0.149 3.40 0.0 clay 9.20 30.2 5.0 0.125 2.49 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.40 30.8 5.3 0.152 2.88 0.0 clay	8.50	27.9	6.5	0.218	3.33	0.0	clay
8.80 28.9 3.7 0.119 3.23 0.0 clay 8.90 29.2 3.9 0.111 2.86 0.0 clay 9.00 29.5 4.2 0.155 3.71 0.0 clay 9.10 29.9 4.4 0.149 3.40 0.0 clay 9.20 30.2 5.0 0.125 2.49 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.40 30.8 5.3 0.152 2.88 0.0 clay	8.60	28.2	4.8	0.125			
8.90 29.2 3.9 0.111 2.86 0.0 clay 9.00 29.5 4.2 0.155 3.71 0.0 clay 9.10 29.9 4.4 0.149 3.40 0.0 clay 9.20 30.2 5.0 0.125 2.49 0.0 clay 9.30 30.5 4.3 0.126 2.94 0.0 clay 9.40 30.8 5.3 0.152 2.88 0.0 clay	8.70	28.5					
9.00     29.5     4.2     0.155     3.71     0.0     clay       9.10     29.9     4.4     0.149     3.40     0.0     clay       9.20     30.2     5.0     0.125     2.49     0.0     clay       9.30     30.5     4.3     0.126     2.94     0.0     clay       9.40     30.8     5.3     0.152     2.88     0.0     clay	8.80	28.9					•
9.10     29.9     4.4     0.149     3.40     0.0     clay       9.20     30.2     5.0     0.125     2.49     0.0     clay       9.30     30.5     4.3     0.126     2.94     0.0     clay       9.40     30.8     5.3     0.152     2.88     0.0     clay	8.90						
9.20     30.2     5.0     0.125     2.49     0.0     clay       9.30     30.5     4.3     0.126     2.94     0.0     clay       9.40     30.8     5.3     0.152     2.88     0.0     clay	9.00	29.5					·
9.30 30.5 4.3 0.126 2.94 0.0 clay 9.40 30.8 5.3 0.152 2.88 0.0 clay							
9.40 30.8 5.3 0.152 2.88 0.0 clay							
9.50 31.2 5.3 0.117 2.21 0.0 silty clay to clay							•
	9.50	31.2	5.3	0.117	2.21	0.0	silty clay to clay

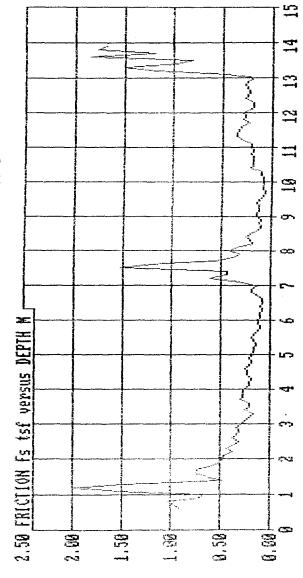
DEPTH	DEPTH	TIP	FRICTION	FR RATIO	INC	
peter	s feet	Qc tef	Fs tsf	Fs/Qc 1	I deg	SOIL TYPE
9.8	0 31.5	5.0	0.085	1.71	0.0	silty clay to clay
9.7		_	0.065	1.40	0.0	
9.8		4.3	0.076	1.79	0.0	
9.9		5.0	9.076 9.076	1.51	0.0	
10.0		5.1	6,088	1.71	0.0	
10.1		5.9	0.093	1.58	0.0	
10.20		5.3	0.101	1.92	0.0	,,,
10.3		4.9	0.112	2.31	0.0	
10.46	34.1	5.1	0.216	4.26	0.0	•
10.50	34.4	5.8	0.181	3.12	0.0	clay
10.60	34.8	5.8	0.193	3.31	0.0	clay
10.70	35.1	6.6	0.190	2.88	0.0	clay
10.80	35.4	6.0	0.202	3.39	0.0	clay
10.90	35.8	5.7	0.189	3.28	0.0	clay
11.00		5.2	0.294	3.95	0.0	clay
11.10		6.5	0.208	3.21	0.0	£lay
11.20		6.7	0.283	4.21	0.0	clay
11.30		7.5	0.345	4.63	0.0	clay
11.40		7.5	0.363	4.86	0.0	clay
11.50		7.3	0.330	4.52	0.0	clay
11.60		6.8	0.315	4.66	0.0	clay
11.70 11.80		5.6 6.5	0.238	4.24	0.0	clay
11.90	39.0	5.7	0.291 0.261	4.51 4.54	0.0	clay
12.00	39.4	7.0	0.283	4.05	0.0	clay
12.10	39.7	6.1	0.203	3.44	0.0	clay clay
12.20		6.0	0.175	2.99	0.0	clay
12.30	40.4	6.3	0.19ê	3.00	0.0	clay
12.40		6.9	0.278	4.00	0.0	clay
12.50	41.0	8.3	0.248	3.00	0.0	clay
12.60	41.3	6.8	0.222	3.20	0.0	clay
12.70	41.7	8.3	0.255	3.05	0.0	clay
12.80	42.0	7.8	0.269	3.44	0.0	clay
12.90	42.3	8.0	0.259	3.25	0.0	silty clay to clay
13.00	42.7	8.5	0.180	2.12	0.0	silty clay to clay
13.10	43.0	9.7	0.450	4.73	0.0	silty clay to clay
13.20	43.3	32.7	1.179	3.61	0.0	silty clay to clay
13.30	43.6	24.3	1.509	6.20	0.0	clay
13.40	44.0	30.5	0.961	3.14	0.0	silty clay to clay
13.50	44.3	14.3	808.0	5 <b>.6</b> 6		clayey silt to silty clay
13.50	44.6	62.0	1.846	2 <b>.9</b> 8		clayey silt to silty clay
13.70	44,9	<b>3</b> 5.4	1.192	3.37		clayey silt to silty clay
13.80	45.3	40.3	1.764	4.37		clayey silt to silty clay
13.90	45.6	73.6	1.690	2.30	0.0	?
14.00	45.9	111.3	9	?	0.0	?

Soil interpretation reference: Robertson & Campanella-1983, based on 60% hammer efficiency and .2 ≠ sliding data average

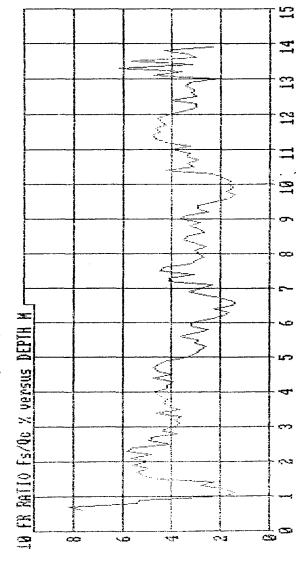
B6-27-94 15;58 LOCATION : P5/BFC-KC MO JOB No. : DACU39-94-M-5862 SOUNDING DATA IN FILE SND-92 OPERATOR: S.VAN
CLIENT: WES



SOUNDING DATA IN FILE SND-92 86-27-94 15:58
OPERATOR: S.UAN
CLIENT: WES
JOB NO. : DACH39-94-M-5862

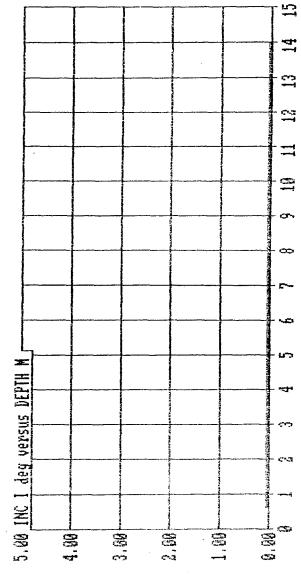


SOUNDING DATA IN FILE SMD-92 06-27-94 15:58
OPERATOR: S.UAN
LOCATION: P5/BFC-KC MO
OLIENT: HES
JOB No.: DACU39-94-M-5862

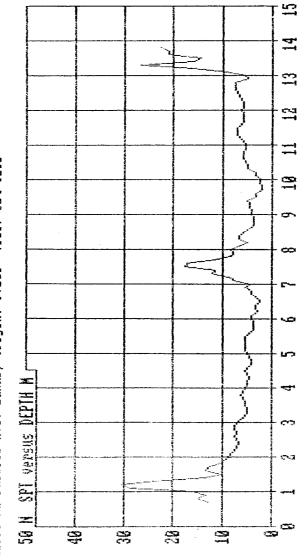


SOUNDING DATA IN FILE SHD-92 06-27-94 15:58
OPERATOR: S.UAN
CLIENT: HES
JOB No. : DACM39-94-M-5062

.



SOUNDING DATA IN FILE SND-92 86-27-94 15:58
OPERATOR: S.VAN
CLIENT: MES
JOB NO. : DACH39-94-M-5862



SCPT P-6

Vandehey Soil Expl.

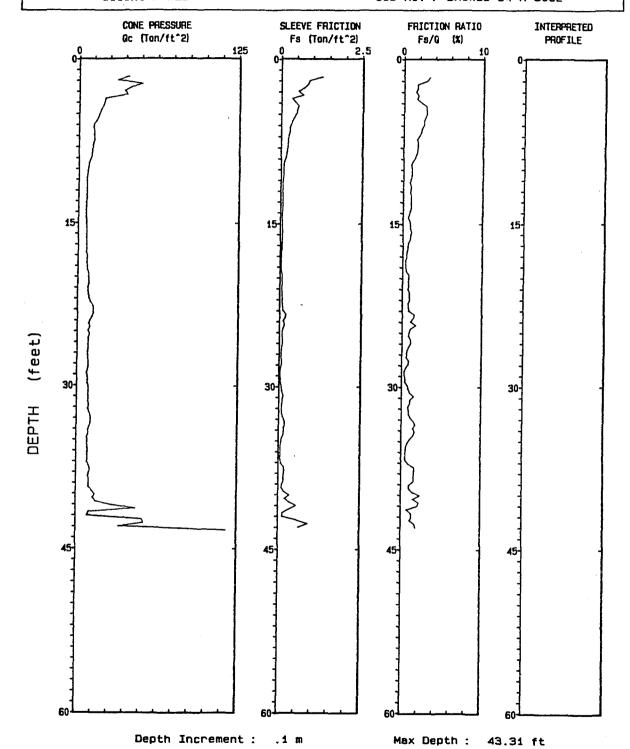
Operator : S.VAN

Sounding: SND100 Pg 1 / 1

Client : WES

CPT Date: 06-29-94 15:55 Location: P-6A/BFC-KC MO

Job No. : DACW39-94-M-5062



SOUNDING DATA IN FILE SND100 06-29-94 15:55

OPERATOR : S.VAN

LOCATION : P-6A/BFC-KC MO

CLIENT : WES

JOB No. : DACW39-94-M-5062

Vandehey Soil Exploration

40695 Nw Pacific Ave. Banks, Oregon. 97106 (503) 324 3261

DEPTH meters	DEPTH feet	TIF Qo tsf	FRICTION Fs tsf	FR RATIO Fs/Qc 1	IMC .I deg	INTERPRETED SOIL TYPE
0.50	1.6	39.2	1.758	3.21	0.1	5
0.60		30.6	0.861	2.81	0.1	sandy silt to clayey silt
6.70		49.8	0.813	1.63	0.1	sandy silt to claye; silt
0.80	2.6	40.5	0.694	1.71	0.1	silty sand to sandy silt
0.90	3.0	35.8	0.522	1.46	0.1	sandy silt to clayey silt
1.00		38.0	0.682	1.79	0.1	sandy silt to clayey silt
1.10	3.6	20.5	0.328	1.59	0.1	sandy silt to clayey silt
1.20	3.9	19.7	0.434	2.20	6.1	clayey silt to silty clay
1.30	4.3	18.8	0.537	2.85	0.1	clayey silt to silty clay
1.40	4.6	17.1	0.479	2.80	0.1	clayey silt to silty clay
1.50	4.9	16.0	0.457	2 <b>.9</b> 2	0.1	clayey silt to silty clay
1.60	5.2	15.2	0.409	2.69	0.1	clayey silt to silty clay
1.70	5.8	13.7	0.344	2.50	0.1	clayey silt to silty clay
1.80	5.9	11.E	0.298	2.56	0.1	clayey silt to silty clay
1.90	6.2	11.3	0 <b>.2</b> 55	2.25	0.1	clayey silt to silty clay
2.00	6.6	12.1	0.261	2.16	0.1	clayey silt to silty clay
2.10	8.9	11.9	0.231	1.94	1.0	clayey silt to silty clay
2.20	7.2	12.4	0.203	1.64	0.1	clayey silt to silty clay
2.30	7.5	11.5	0.211	1.82	0.1	clayey silt to silty clay
2.40	7.9	10.9	0.192	1.76	0.1	clayey silt to silty clay
2.50	8.2	10.7	0.188	1.76	0.1	clayey silt to silty clay
2.60	8.5	10.4	0.170	1.64	0.1	clayey silt to silty clay
2.70	8.9	9.8	0.141	1.43	0.1	clayey silt to silty clay
2.80	9.2	8.7	0.098	1.13	0.1	clayey silt to silty clay
2.90	9.5	7,8	0.071	0.91	0.1	clayey silt to silty clay
3.00	9.8	7.3	0.077	1.05	0.1	sensitive fine grained
3.10	10.2	8.8	0.072	1.05	0.1	sensitive fine grained
3.20	10.5	6.7	0.071	1.05	0.1	sensitive fine grained
3.30	10.8	6.3	0.056	0.89	0.1	sensitive fine grained
3.40	11.2	6.1	6.048	0.79	0.1	sensitive fine grained
3.50	11.5	8.8	0.056	0.97	0.0	sensitive fine grained
3.60	11.8	5.4	0.052	0.97	0.0	sensitive fine grained
3.70	12.1	6.8	0.058	0.87	0.0	sensitive fine grained
3.80	12.5	€.4	0.065	1.01	0.0	sensitive fine grained
3.90	12.8	6.4	0.063	0.98	0.0	sensitive fine grained
4.00	13.1	5.8	0.057	0.97	0.0	sensitive fine grained
4.10	13.5	6.2	0.062 0.062	1.01	0.0	sensitive fine grained
4.20	13.8	5.7	0.048	0.84	0.0	sensitive fine grained
4.30	14.1	5.9.	0.041	0.70	0.0	sensitive fine grained
4.40	14.4	-6.0	0.038	0.64	0.0	sensitive fine grained

Soil interpretation reference: Robertson & Campanella-1983, based on 602 hammer efficiency and .2 m sliding data average

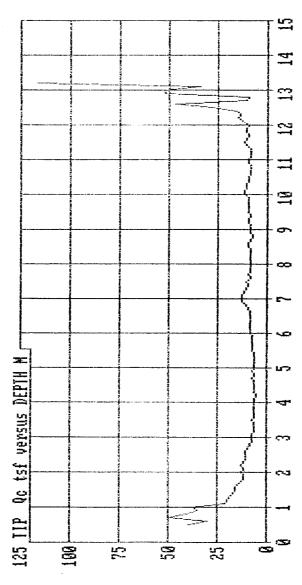
					•	TUTES S S T T T T T T T T T T T T T T T T
DEPTH	DEPTH	TIP	FRICTION	FR RATIO	INC	INTERPRETED
<b>e</b> eters	feet	Qo tsf	Fa taf	Fs/Qc %	I deg	SOIL TYPE
4.50	14.8	€.7	0.059	0.89	0.0	sensitive fine grained
4.60	15.1	6.6	0,062	0.94	0.0	sensitive fine grained
4.70	15.4	6.8	0.054	0.95	0.0	sensitive fine grained
4.80	15.7	6.7	0.075	1.11	0.0	sensitive fine grained
4.90	16.1	6.8	0.063	0.92	0.0	sensitive fine grained
5.00	16.4	6.6	0.061	0.91	0.0	sensitive fine grained
5.10	15.7	6.4	0,041	0.63	0.0	sensitive fine grained
5.20	17.1	5.3	0.935	0.56	0.0	sensitive fine grained
5.30	17.9	6.7	0.937	0.55	0.0	sensitive fine grained
5.40	17.7	6.4	0.025	4,45	0,0	sensitive fine grained
5.50	18.0	7.4	0.034	0.45	0.0	sensitive fine grained
5.60	18.4	7.0	0.021	6.30	8.0	sensitive fine grained
5.70	18.7	6.8	0.024	#.35	0.0	sensitive fine grained
5.80	19.0	7.4	0.026	0.35	0.0	sensitive fine grained
5.90	19.4	7.5	0.034	0.46	0.0	sensitive fine grained
6.00	15.7	8.5	0.066	0.78	0.0	sensitive fine grained
6.10	20.0	8.5	0.062	6.73	0.0	clayey silt to silty clay
8.20	20.3	8.7	0.058	9.67	0.0	clayey silt to silty clay
6.30	20.7	8.8	0.071	0.81	0.0	clayey silt to silty clay
6,40	21.0	8.2	0.054	0.88	0.0	sensitive fine grained
6.50	21.3	8.2	0.074	0.51	0.0	clayey silt to silty clay
6.60	21.7	8.8	0.075	0.85	0.0	clayey silt to silty clay
6.70	22.0	9.3	0.086	0.92	0.0	clayey silt to silty clay
6.80	22.3	10.4	0.070	0.67	0.0	sandy silt to clayey silt
6.90	22.6	12.4	0.093	0.75	0.0	sandy silt to clayey silt
7.00	23.0	12.7	0.105	0.83	0.0	sandy silt to clayey silt
7.10	23.3	12.4	0.187	1.51	0.0	clayey silt to silty clay
7.20	23.5	11.3	0.152	1.35	0.0	clayey silt to silty clay
7.30	23.9	10.0	0.105	1.04	0.0	clayey silt to silty clay
7.40	24.3	8.9	0.155	1.73	0.0	clayey silt to silty clay
7.50	24.6	9.9	0.098	0.99	0.0	clayey silt to silty clay
7.60	24.9	8.3	0.070	0.84	0.0	clayey silt to silty clay
7.70	25.3	9.8	0.078	0.78	0.0	clayey silt to silty clay
7.80	25.6	8.5	0,090	1.05	0.0	clayey silt to silty clay
7.90	25.9	8.8	0.096	1.10	0.0	clayey silt to silty clay
8.00	26.2	8.5	0.068	0.80	0.0	clayey silt to silty clay
8.10	26.6	8.5	0.050	0.59	6.0	sensitive fine grained
8.20	25.9	8.2	0.043	6.53	ű,û	sensitive fine grained
8.30	27.2	8.2	0.045	0.56	0.0	sensitive fine grained
8,40	27.6	8.8	0.076	0.67	0.0	clayey silt to silty clay
8.50	27.9	9.3	0.072	0.77	0.0	clayey silt to silty clay
8.80	28.2	9.0	0.039	().44	0.0	sensitive fine grained
8.70	28.5	8.3	0.021	0.25	0.0	sensitive fine grained
8.80	28.9	7.5	0.022	0.30	0.0	sensitive fine grained
8.90	29.7	8.5	9.035	0.42	0.6	sensitive fine grained
9.00	29.5	8.1	0.033	0.41	0.0	sensitive fine grained
9.10	29.9	8.5	0.062	0.73	0.0	sensitive fine grained
9.20	30.2	9.4	0.078	0.83	0.0	clayey silt to silty clay
9.30	30.5	9.1	0.094	1.03	0.0	clayey silt to silty clay
9,40	30.8	8.8	0.135	1.54	0.0	clayey silt to silty clay
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Soil interpretation reference: Robertson & Campanella-1983, based on 60% hammer efficiency and .2 m sliding data average

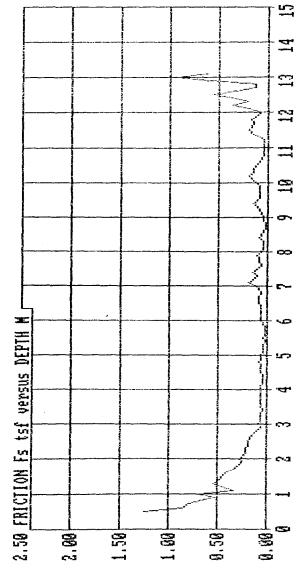
DEPTH	DEPTH	TIP	FRICTION	FR RATIO	INC	INTERPRETED
meters	feet	Qc tsf	Fs tsf	Fs/Qc ≇	I deg	SOIL TYPE
9.50	31.2	9.7	0.095	1.03	0.0	clayey silt to silty clay
9.60	31.5	8.9	0.088	0.99	0.0	clayey silt to silty clay
9.70	31.8	9.8	0.073	0.76	0.0	clayey silt to silty clay
9.80	32.2	8.9	0.076	0.88	0.0	clayey silt to silty clay
9,90	32.5	9.9	6.688	0.89	0.0	clayey silt to silty clay
10.00	32.€	11.0	0.122	1.11	0.0	clayey silt to silty clay
10.10	33.1	11.2	0.165	1.51	0.0	clayey silt to silty clay
10.20	33.5	10.8	0.189	1.75	$\hat{u}_*\hat{u}$	clayey silt to silty clay
10.30	33.8	10.0	0.147	1.46	0.0	clayey silt to silty clay
10.40	34.1	9.2	6.15+	33.1	0.0	clayey silt to silty clay
10.56	34.4	9.3	0.135	1.48	0.0	clayey silt to silty clay
10.60	34.8	8.3	0.088	1.04	0.0	clayey silt to silty clay
10.70	35.1	8.7	0.065	0.75	0.0	clayey silt to silty clay
10.80		8.5	0.048	0.56	0.0	sensitive fine grained
10.90	35.8	9.0	0.045	0.51	0.0	sensitive fine grained
11.00	3E.1	9.0	0.042	0.47	0.0	sensitive fine grained
11.10	36.4	8.8	0.042	0.47	0.0	sensitive fine grained
11.20	35.7	8.8	0.045	0.51	0.0	sensitive fine grained
11.30	37.1	8.4	0.075	0.88	0.0	clayey silt to silty clay
11.40	37.4	10.1	0.164	1.62	0.0	clayey silt to silty clay
11.50	37.7	10.9	0.180	1,64	0.0	clayey silt to silty clay
11.60	38.1	10.1	0.157	1.58	0.0	clayey silt to silty clay
11.70	38.4	5.3	0.141	1.51	0.0	clayey silt to silty clay
11.80	38.7	10.3	0.155	1.54	0.0	clayey silt to silty clay
11.90	39.0	10.0	0.097	0.97	0.0	clayey silt to silty clay
12.00	39.4	9.7	0.091	0.94	0.0	clayey silt to silty clay
12.10	39.7	12.6	0.181	1.44	0.0	clayey silt to silty clay
12.20	40.0	15.0	0.355	2.39	0.1	clayey silt to silty clay
12.30	40.4	13.4	0.205	1.53	0.0	clayey silt to silty clay
12.40	40.7	15.6	0.352	2.26	0.0	clayey silt to silty clay
12.50	41.0	27.9	0.569	2.03	0.0	sandy silt to clayey silt
12.60	41.3	47.1	0.334	0.71	0.0	silty sand to sandy silt
12.70	41.7	10.2	0.131	1.28	0.0	sandy silt to clayey silt
12.80	42.0	8.9	0.119	1.33	0.0	sandy silt to clayey silt
12.90	42.3	52.1	0.578	1.11	0.0	silty sand to sandy silt
13.00	42.7	53.1	0.922	1.73	0.0	silty sand to sandy silt
13.10	43.0	34.0	0.632	1.86	0.0	?
13.20	43.3	117.0	?	7	0.0	?

Soil interpretation reference: Robertson & Campanella-1983, based on 80% hammer efficiency and .2 m sliding data average

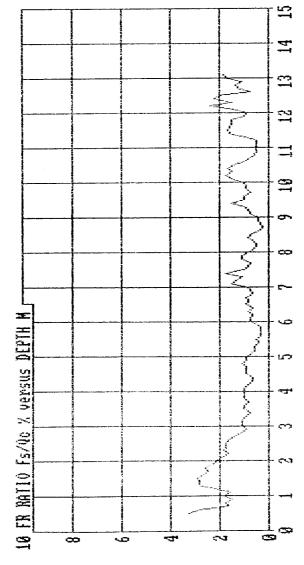
SOUNDING DATA IN FILE SNDIGG 66-29-94 15:55
OPERATOR: S.UAN
LOCATION: P-6A/BFC-KC MO
CLIENT: WES
JOB NO. : DACH39-94-M-5862



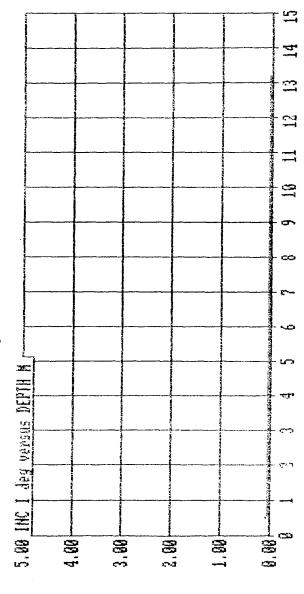
SOUNDING DATA IN FILE SNDIGG 66-29-94 15:55 OPERATOR: S.UAN LOCATION: P-6A/BFC-KC MO CLIENT: WES JOB No. : DACU39-94-M-5062



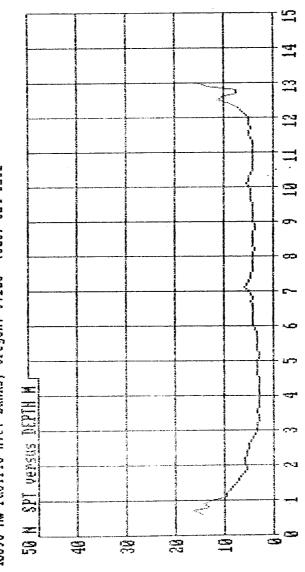
SOUNDING DATA IN FILE SHOLDO 06-29-94 15:55
OPERATOR: S.UAN
LOCATION: P-6A/BFC-KC NO
CLIENT: MES
JOB No.: DACH39-94-M-5062



SOUNDING DATA IN FILE SHD188 86-29-94 15:55
OPERATOR: S. VAN
CLIENT: WES
JOB No.: DACH39-94-M-5862



SOUNDING DATA IN FILE SHDIGG 86-29-94 15:55
OPERATOR: S.UAR
CLIENT: MES
JOB No.: DACH39-94-M-5062



SCPT P-7

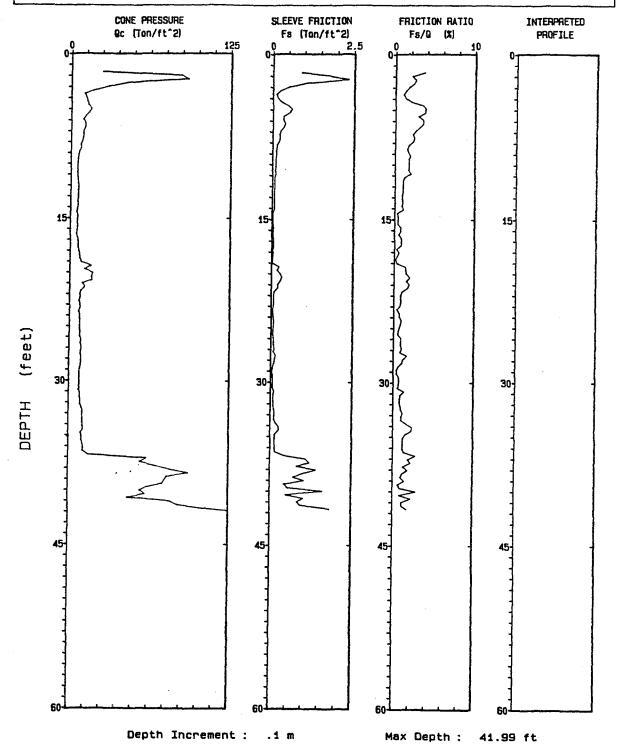
Vandehey Soil Expl

Operator : S.VAN
Sounding : SND101 Pg 1 / 1

CPT Date: 06-29-94 17:20 Location: P-7/BFC-KC MD

Client : WES

Job No. : DACW39-94-M-5062



SOUNDING DATA IN FILE SND101 06-29-94 17:20

OPERATOR : S.VAN

LOCATION : P-7/BFC-KC MO

CLIENT : WES

JOB No. : DACW39-94-M-5062

Vandehey Soil Exploration 40695 Nw Pacific Ave. Banks, Oregon. 97106 (503) 324 3261

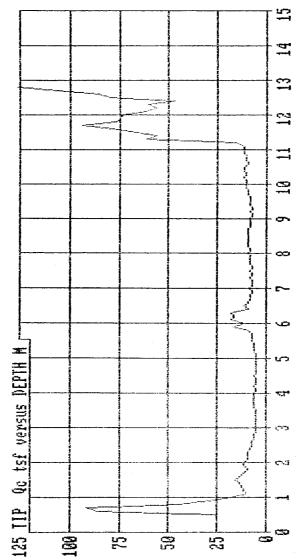
DEFTH	DEPTH	TIF	FRICTION	FR RATIO	INC	INTERPRETED
aeter s	feet	Qc tsf	Fs tsf	Fs/Qc 🖫	: deg	SOIL TYPE
0.50	1.6	25.0	0.969	3.64	6.5	
û. <del>G</del> û	2.0	86.5	1.779	2.06	0.0	sandy silt to clayey silt
6.70	2.3	91.7	2.323	2.53	0.1	sandy silt to clayey silt
0.80	2.6	44.0	0.993	2.25	0.0	sandy silt to clayey silt
0.90	3.0	29.3	0.491	1.68	0.1	sandy silt to clayey silt
1.00	3.3	17.7	0.224	1.27	0.1	sandy silt to clayey silt
1.10	3.6	10.4	0.103	0.99	0.1	sandy silt to clayey silt
1.20	3.9	11.9	0.152	1.27	0.1	clayey silt to silty clay
1.30	4.3	12.7	0.250	1.97	6.1	clayey silt to silty clay
1.40	4.6	13.7	0.456	3.46	1.0	silty clay to clay
1.50	4.9	15.6	0.589	3.77	0.1	silty clay to clay
1.60	5.2	14.0	0.517	3.68	0.1	silty clay to clay
1.70	5.6	11.3	0.323	2.95	0.1	silty clay to clay
1.60	5.9	9.2	0.320	3.49	0.1	silty clay to clay
1.90	6.2	11.0	0.382	3.46	0.1	silty clay to clay
2.00	9.8	11.0	0.328	2.97	0.1	silty clay to clay
2.10	6.9	9.5	0.240	2.51	0.1	silty clay to clay
2.20	7.2	9.5	0.204	2.16	0.1	silty clay to clay
2.30	7.5	9.3	0.222	2.38	0.1	silty clay to clay
2.40	7.9	3.8	0.187	2.18	0.1	silty clay to clay
2.50	8.2	7.4	0.123	1.67	0.0	clayey silt to silty clay
2.60	8.5	7.5	0.110	1.47	0.0	clayey silt to silty clay
2.70	8.9	6.5	0.107	1.66	0.0	silty clay to clay
2.80	9.2	5.8	0.111	1.91	0.0	silty clay to clay
2.93	9.5	5.5	0.092	1.67	0.0	silty clay to clay
3.00	9.8	5.2	0.089	1.70	0.0	sensitive fine grained
3.10	10.2	5.1	0.087	1.71	0.0	sensitive fine grained
3.20	10.5	4.9	0.081	1.67	0.0	silty clay to clay
3.30	10.8	5.2	0.103	1.98	0.0	sensitive fine grained
3.40	11.7	5.3	0.061	1.14	0.0	sensitive fine grained
3.50	11.5	5.7	0.054	0.94	0.0	sensitive fine grained
3.60	11.8	5.9	0.057	0.96	0.0	sensitive fine grained
3.70	12.1	6.2	0.057	0.92	0.0	sensitive fine grained
3.80	12.5	6.1	0.062	1.01	0.0	sensitive fine grained
3.90	12.8	6.2	0.054	38.0	0.0	sensitive fine grained
4.00	13.1	5.9	0.052	0.88	0.0	sensitive fine grained
4.10	13.5	5.4	0.052	0.96	0.0	sensitive fine grained
4.20	13.8	6.0	0.050	0.63	0.0	sensitive fine grained
4.30	14.1	5.3	0.055	1.04	0.0	sensitive fine grained
4.40	14.4	4:8	0.013	0.28	0.0	sensitive fine grained

DEPTH	DEPTH	TIP	FRICTION	FR RATIO	INC	INTERPRETED
seters	feet	Qc tsf	Fs tsf	Fs/Qc I	I deg	SOIL TYPE
		•				
4.50	14.8	6.0	0.028	0.43	0.0	sensitive fine grained
4.60	15.1	5.4	0.019	0.36	0.0	sensitive fine grained
4.70	15.4	5.3	0.021	0.39	0.0	sensitive fine grained
4.60	15.7	5.5	0.042	0.76	0.0	sensitive fine grained
4.90	16.1	5.2	0.(4)	0.79	0.0	sensitive fine grained
5.00	16.4	4.9	0,025	0.52	0.0	sensitive fine grained
5.10	16.7	5.4	0.0-7	0.87	0.0	sensitive fine grained
5.20	17.1	. 6.1	0,948	0.78	0.0	sensitive fine grained
5.30	17.4	€.2	0.(47	0.76	0.0	sensitive fine grained
5.40	17.7	6.1	0.015	0.24	0.0	sensitive fine grained
5.50	18.0	7.1	(1,000)	0.58	0.0	sensitive fine grained
5.60	18.4	7.5	0,024	0.32	0.0	sensitive fine grained
5.70	18.7	7.8	6.005	0.08	0.0	sensitive fine grained
5.89	19.0	8.9	0.029	0.33	0.0	sandy silt to clayey silt
5.50	19.4	16.9	0.235	1.39	0.0	sandy silt to clayey silt
6.00	19.7	11.8	0.172	1.46	0.0	sandy silt to clayey silt
6.10	20.0	18.1	0.275	1.52	0.0	sandy silt to clayey silt
6.20	20.3	16.8	0.327	1.95	0.0	sandy silt to clayey silt
6.30	20.7	17.4	0.2E4	1.51	0.0	clayey silt to silty clay
-5.40	21.0	9.8	0.183	1.86	0.0	clayey silt to silty clay
6.50	21.3	11.6	0.187	1.61	0.0	clayey silt to silty clay
6.60	21.7	8.9	980.0	0.96	0.0	clayey silt to silty clay
8.70	22.0	7.9	0.064	0.80	0.0	clayey silt to silty clay
6.80	22.3	8.3	0.067	0.80	0.0	sensitive fine grained
6.90	22.6	7.4	0.063	0.85	0.0	sensitive fine grained
7.00	23.0	8.2	0.057	0.70	0.0	sensitive fine grained
7.10	23.3	7.7	0.029	0.37	0.0	sensitive fine grained
7.20	23.€	7.1	0.048	0.68	0.0	sensitive fine grained
7.39	23.9	8.1	0.056	0.69	0.0	sensitive fine grained
7.40	24.3	7.8	0.077	0.93	0.0	sensitive fine grained
7.50	24.€	8.2	0.064	0.78	0.0	sensitive fine grained
7.60	24.9	7.8	0.050	0.65	0.0	sensitive fine grained
7.70	25.3	7.8	0.041	0.52	0.0	sensitive fine grained
7.80	25.€	8.3	9.645	0.54	0.6	sensitive fine grained
7.90	25.9	8.3	0.076	0.91	0.0	clayey silt to silty clay
8.00	26.2	9.3	0.078	0.83	0.0	clayey silt to silty clay
8.10	26.8	8.7	0.072	0.82	0.0	clayey silt to silty clay
8.20	26.9	9.5	0.095	1.00	0.0	clayey silt to silty clay
8.30	27.2	9.0	0.074	0.82	0.0	clayey silt to silty clay
8.40	27.6	8.9	0.146	1.65	0.0	clayey silt to silty clay
8.50	27.9	9.6	0.109	1.14	0.0	clayey silt to silty clay
8.60	28.2	9.4	0.095	1.01	0.0	clayey silt to silty clay
8.70	28.5	9.0	0.045	0.54	0.0	clayey silt to silty clay
8.80	28.9	8.4	0.033	0.39	0.0	sensitive fine grained
8.90	29.2	7.9	0.035	0.44	0.0	sensitive fine grained
9.00	29.5	7.8	0.052	0.66	0.0	sensitive fine grained
9.10	29.9	7.8	0.053	0.68	0.0	sensitive fine grained
9.20	30.2	7.9	0.048	0.60 0.56	0.0 0.0	sensitive fine grained sensitive fine grained
9.30	30.5	7.7		0.54		clayey silt to silty clay
9.40	30.8	7.8	0.105	1.34	0.0	clayey Silt to Silty Clay

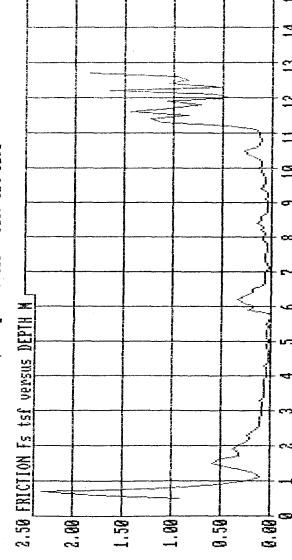
DEPTH	DEPTH	TIP	FRICTION	FR RATIO	INC	INTERPRETED
meters	feet	Qo tsf	Fs tsf	Fs/Qc %	I deg	SOIL TYPE
9.50	31.2	8.8	0.074	0.84	0.0	clayey silt to silty clay
9.60	31.5	8.6	9.067	0.78	0.0	clayey silt to silty clay
9.70	31.8	9.1	0.066	0.73	0.0	clayey silt to silty clay
9.80	32.2	8.9	0.077	0.87	0.0	clayey silt to silty clay
9.90	32.5	10.0	0.095	0.95	0.0	clayey silt to silty clay
10.00	32.8	10.9	0.128	1.18	0.0	clayey silt to silty clay
10.10	33.1	10.8	0.109	1.01	0.0	clayey silt to silty clay
10.20	33.5	10.9	0.108	0.97	0.0	clayey silt to silty clay
10.30	33.8	10.6	0.171	1.61	0.0	clayey silt to silty clay
10.40	34.1	11.1	0.250	2.33	0.0	clayey silt to silty clay
10.50	34.4	11.3	0.2E2	2.32	0.0	clayey silt to silty clay
10.60	34.8	9.6	0.145	1.55	0.6	clayey silt to silty clay
10.70	35.1	10.2	0.121	1.19	0.0	clayey silt to silty clay
10.80	35.4	0.01	0.113	1.13	0.0	clayey silt to silty clay
10.90	35.8	10.5	0.128	1.17	0.0	clayey silt to silty clay
11.00	36.1	11.5	0.125	1.10	0.0	clayey silt to silty clay
11.10	38.4	11.2	0.157	1.40	0.0	clayey silt to silty clay
11.20	36.7	15.6	6.431	2.77	0.0	sandy silt to clayey silt
11.30	37.1	61.4	1.128	1.84	0.0	sandy silt to clayey silt
11.40	37.4	56.1	1.228	2.19	0.0	silty sand to sandy silt
11.50	37.7	67.0	0.846	1.28	0.0	silty sand to sandy silt
11.60	38.1	79.2	1.442	1.82	0.0	silty sand to sandy silt
11.70	38.4	93.8	1.027	1.09	0.0	sand to silty sand
	38.7	77.1	0.731	0.95	0.0	sand to silty sand
	39.0	75.1	1.067	1.42	0.0	sand to silty sand
	39.4	73.5	0.437	0.59	0.1	sand to silty sand
	39.7	61.7	0.565	0.92	0.1	silty sand to sandy silt
	40.0	56.5	1.640	2.90	0.1	silty sand to sandy silt
	40.4	50.4	0.504	0.83	0.1	silty sand to sandy silt
	40,7	46.9	1.047	2.23	0.1	silty sand to sandy silt
	41.0	80.0	0.854	1.07	0.1	silty sand to sandy silt
	41.3	85.8	6 <b>.9</b> 58	1.13	0.1	sand to silty sand
	41.7	108.1	1.851	1.74	0.1	?
17.80	42.0	135.7	- 5	?	0.5	?

SOUNDING DATA IN FILE SHDIBL 86-29-94 17:28
OPERATOR: S.UAN
LOCATION: P-7/BFG-KC NO
CLIENT: WES
JOB No.: DACH39-94-M-5862

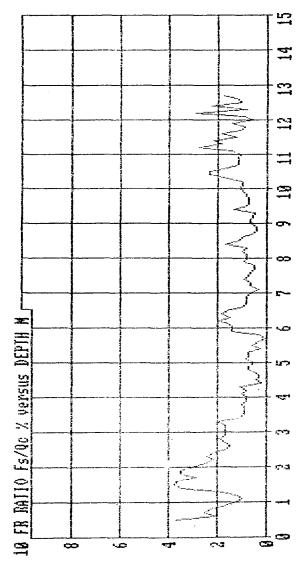




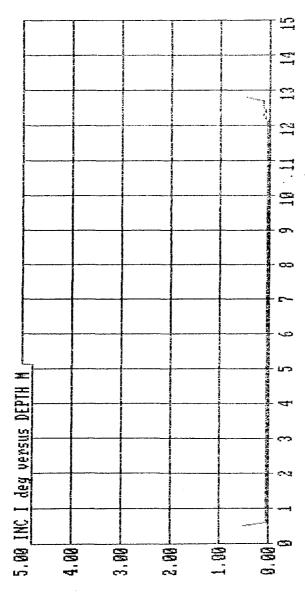
SOUNDING DATA IN FILE SND101 86-29-94 17:20
OPERATOR: S.UAN
CLIENT: WES
JOB NO.: DACK39-94-M-5



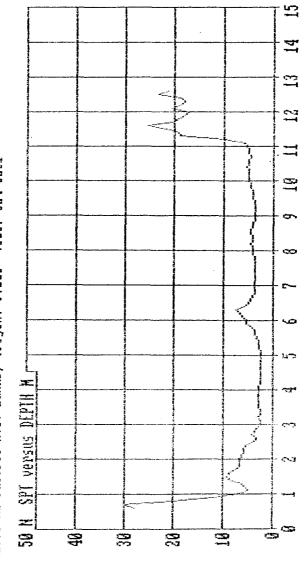
SOUNDING DATA IN FILE SHDIGI 86-29-94 17:28
OPERATOR: S.UAN
CLIENT: WES
JOB No.: DACK39-94-M-5062



SOUNDING DATA IN FILE SNDIGI G6-29-94 17;28
OPERATOR: S.UAN
CLIENT: WES
JOB No.: DACU39-94-M-5062



SOUNDING DATA IN FILE SHDIBI 86-29-94 17:28
OPERATOR: S.VAN
CLIENT: WES
JOB No.: DACK39-94-8



SCPT P-8

Vandehey Soil Expl.

Operator : S.VAN

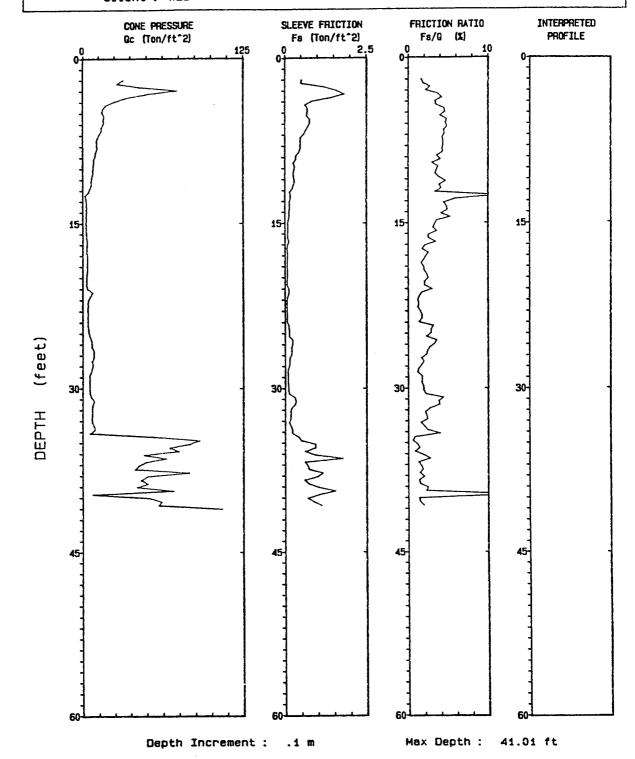
CPT Date : 06-27-94 18:52

Sounding: SND-93 Pg 1 / 1

Location: P-8/BFC-KC MO

Client: WES

Job No. : DACW39-94-M-5062



SOUNDING DATA IN FILE SND-93 06-27-94 18:52

OPERATOR : S.VAN

LOCATION : P-8/BFC-KC MO

CLIENT : WES

JOB No.

: DACW39-94-M-5062

Vandehey Soil Exploration

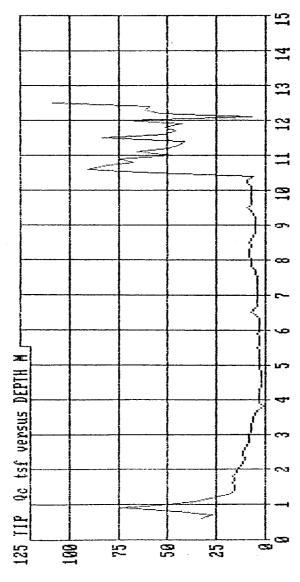
40695 Nw Pacific Ave. Banks, Oregon. 97106 (503) 324 3261

DEPTH	DEPTH	116	FRICTION	FR RATIO	INC	INTERPRETED
meters	feet	Qc tsf	fs tsf	Fs/Qc %	l deg	SOIL TYPE
0.60		32.1	0.520	1.62	0.1	•
0.70		27.3	0.502	1.84	0.1	sandy silt to clayey silt
0.80		44.8	1.208	2.70	0.1	sandy silt to clayey silt
0.90		73.7	1.580	2.14	0.1	sandy silt to clayey silt
1.00	3.3	49.4	1.830	3.71	0.1	clayey silt to silty clay
1.10		33.8	1.419	4.19	0.1	clayey silt to silty clay
1.20		24.9	0.827	3.32	0.1	clayey silt to silty clay
1.30		16.1	0.620	3.43	0.1	silty clay to clay
1.40	4.6	15.7	0.701	4.4?	0.1	clay
1.50	4.9	15.2	0.695	4.58	0.0	clay
1.50	5.2	17.0	899.0	3.94	0.1	clay
1.70	5.6	16.1	0.770	4.80	0.1	clay
1.90	5.9	16.4	0.761	4.63	0.1	clay
1.90	6.2	14.5	0.707	4.83	0.1	clay
2.00	8.8	14.5	0.638	4.39	0.1	clay
2.10	6.9	12.9	0.579	4.51	0.1	clay
2.20	7.2	11.5	0.481	4.20	0.1	clay
2.30	7.5	10.8	0.470	4.36	0.1	clay
2.40	7.9	11.0	0.474	4.33	0.1	clay
2.50	8.2	11.2	0.473	4.21	0.1	clay
2.E0	8.5	9.9	0.426	4.29	0.1	clay
2.70	8.9	9.5	0.335	3.54	0.1	clay
2.80	9.2	8.2	0.329	4.02	0.1	clay
2.90	9.5	8.5	0.252	2.96	0.0	clay
3.00	9.8	8.0	0.300	3.73	0.0	clay
3.10	10.2	7.8.	0.269	3.46	0.0	clay
3.20	10.5	7.5	0.253	3.37	0.0	clay
3.30	10.8	6.9	0.272	3.92	0.0	clay
3.40	11.2	€.4	0.300	4.67	0.0	clay
3.50	11.5	8.8	0.256	3.86	0.1	clay
3.60	11.8	5.4	0.224	4.11	0.1	clay
3.70	12.1	4.2	0.140	3.33	0.1	clay
3.80	12.5	1.5	0.171	11.31	0.1	organic material
3.90	12.8	2,5	0.152	5.82	0.1	organic material
4.00	13.1	2.8	0.126	4.44	0.1	clay
4.10	13.5	2.8	0.132	4.79	0.1	clay
4.20	13.8	2.7	0.133	4.94	0.0	clay
4.30	14.1	2.8	0.113	4.08	0.1	clay
4.40	14.4	2.3	0.123	5.28	0.0	clay
4.50	14.8	2.5	0.099	3.51	0.1	clay
						•

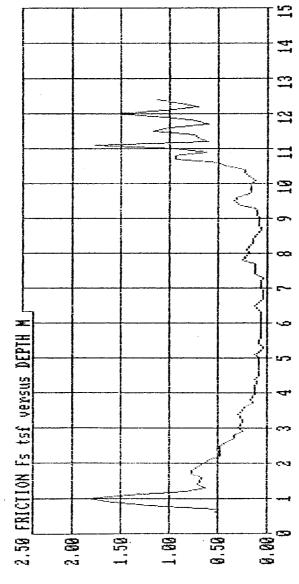
nen <b>7</b> 11	חבטבוו	770	FRICTION	FR RATIO	INC	INTERPRETED
DEPTH	DEPTH	IIP	Fs tsf	Fs/Qc Z	I deg	SOIL TYPE
aeters	теет	Qc tsf	FS CSI	13/46 4	1 009	••••
4.60	15.1	2.3	0.073	3.25	0.1	clay
4.70	15.4	2.5	0.080	3.07	0.1	clay
4.80		2.5	0.090	3.58	0.1	clay
4.90		3.0	0.073	2.45	0.1	clay
5.00		3.0	0.076	2.53	0.1	clay
5.10		3.5	0.123	3.48	0.1	clay
5.20		3.2	0.065	2.04	0.1	clay
5.30		3.0	0.051	1.71	0.1	sensitive fine grained
5.40		3.0	0.074	2.50	0.1	clay
5.50		3.8	0.081	2.13	0.0	clay
5.£0		3.5	330.0	1.87	0.0	sensitive fine grained
5.70		3.5	0.055	1.59	0.0	sensitive fine grained
5.80		3.2	0.062	1.93	0.1	sensitive fine grained
		3.7	0.002	1.99	0.0	clay
5.90		3.1	0.071	2.31	0.0	clay
6.00		2.8	820.0	2.46	0.0	clav
6.10		2.8	0.056	2.00	0.0	sensitive fine grained
6.20		2.7	0.054	2.00	0.0	clay
6.30			0.054	2.98	0.0	clay
6.40		3.8 7.8	0.114	1.62	0.0	silty clay to clay
6.50		5.8	0.121	1.32	0.0	sensitive fine grained
6.60				1.14	0.0	sensitive fine grained
6.70		4.3	0.049	1.14	0.0	sensitive fine grained
6.80				1.16	0.0	sensitive fine grained
6.90		4.0		1.48	0.0	sensitive fine grained
7.00		3.8		1.72	0.0	sensitive fine grained
7.10				1.67	0.0	sensitive fine grained
7.20				1.33	0.0	sensitive fine grained
7.3		3.9			0.1	clay
7.4				3.12	0.0	clay
7.5					0.0	clay
7.6						clay
7.7					0.0	clay
7.8					0.0	clay
7.9					0.0	silty clay to clay
8.0					0.0	silty clay to clay
8.1					0.0	silty clay to clay
6.2					0.0 0.0	clayey silt to silty clay
8.3					0.0	clayey silt to silty clay
8.4						clayey silt to silty clay
8.5						sensitive fine grained
8.6						sensitive fine grained
8.7						sensitive fine grained
8.8						sensitive fine grained
8.9						silty clay to clay
9.0						silty clay to clay
9.						silty clay to clay
9.3						clay
9.5						clay
9.						clay
9.	50 31.	2 9.	0.33	9 3.77	0.0	Lidy

DEPTH	DEPTH	TIP	FRICTION	FR RATIO	INC	INTERPRETED
meters	reet	Oc tsf	Fs tsf	Fs/Qc 2	I deg	SOIL TYPE
meters	1661	QC (S)	15 (5)	1 37 40 4	1 009	0010 1170
9.60	31.5	7.7	0.303	3.91	0.0	clay
9.70	31.8	7.2	0.191	2.67	0.0	silty clay to clay
9.80	32.2	7.6	0.160	2.09	0.0	silty clay to clay
9.90	32.5	7.4	0.167	2.28	0.0	silty clay to clay
10,00	32.8	7.0	0.167	2.40	0.0	silty clay to clay
10.10	33.1	7.5	0.116	1.54	0.0	silty clay to clay
10.20	33.5	9.0	0.179	1.99	0.0	clayey silt to silty clay
10.30	33.8	9.5	0.22.	2.35	0.0	silty clay to clay
10.40	34.1	5.7	0.229	3.99	0.0	sandy silt to clayey silt
10.50	34,4	55.5	0.422	0.75	0.0	silty sand to sandy silt
10.50	34.8	1.18	0.506	0.56	0.0	sand to silty sand
10.79	35.1	83.0	0.939	1.13	0.0	sand to silty sand
10.80	35.4	69.0	0.939	1.36	0.0	silty sand to sandy silt
10.90	35.8	75.2	0.625	0.83	0.0	silty sand to sandy silt
11.00	36.1	48.3	0.944	1.96	0.0	silty sand to sandy silt
11.10	3E.4	65.2	1.772	2.72	0.0	sandy silt to clayey silt
11.20	3£.7	49.3	0.614	1.25	0.0	silty sand to sandy silt
11.36	37.1	43.9	0.702	1.60	0.0	silty sand to sandy silt
11.40	37.4	41.3	0.748	1.8i	0.0	silty sand to sandy silt
11.50	37.7	83.2	i.162	1.40	0.0	silty sand to sandy silt
11.60	38.1	50.€	1.004	1.98	0.0	silty sand to sandy silt
11.70	38.4	45.9	0.602	1.31	0.0	silty sand to sandy silt
11.80	36.7	50.9	0.739	1.45	0.0	silty sand to sandy silt
11.90	39.0	42.9	1.047	2.44	0.0	sandy silt to clayey silt
12.00	39.4	70.8	1 <b>.5</b> 51	2.19	0.0	sandy silt to clayey silt
12.10	39.7	7.7	1.047	13.57	0.0	clayey silt to silty clay
12.20	40.0	52.7	0.703	1.33	0.0	sandy silt to clayey silt
12.30	40.4	€1.7	0.899	1.44	0.0	silty sand to sandy silt
12.40	40.7	59.4	1.124	1.89	0.2	?
12.50	41.0	108.7	7	2	0.2	?

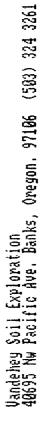
SOUNDING DATA IN FILE SND-93 86-27-94 18:52 OPERATOR: S.VAN LOCATION: P-8/BFG-KC MO CLIENT: WES JOB NO: : DACH39-94-M-5862

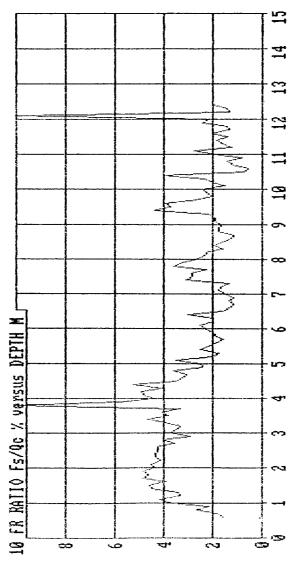


SOUNDING DATA IN FILE SND-93 86-27-94 18:52
OPERATOR: S.UAN
CLIENT: WES
JOB No.: DACH39-94-M-5862

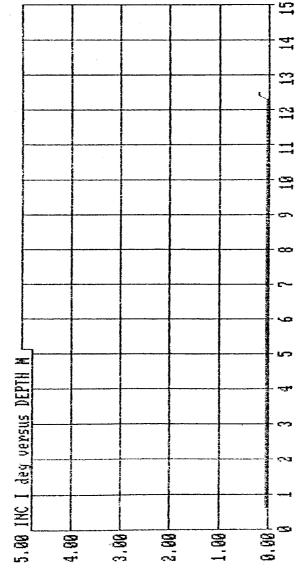


SOUNDING DATA IN FILE SND-93 G6-27-94 18:52 OPERATOR: S.UAN LOCATION: P-8/BFC-KC MO CLIENT: WES JOB No. : DACU39-94-M-5062





SOUNDING DATA IN FILE SND-93 G6-27-94 18;52
OPERATOR: S.UAH
CLIENT: WES
JOB No.: DACH39-94-M-5062



SCPT P-9

Soil  $E \times P$ /andehey CPT Date: 06-27-94 21: 24

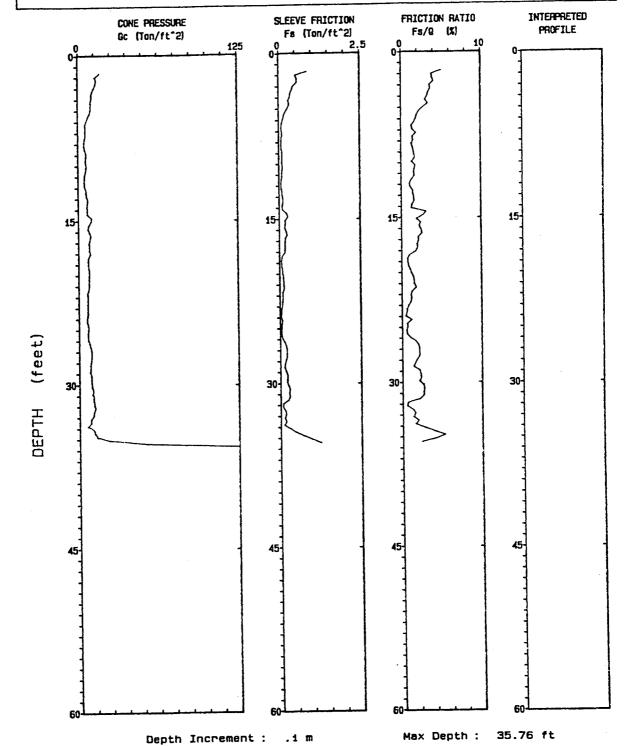
Operator : S.VAN

Location: P-9/BFC-KC MO

Sounding: SND-94 Pg 1 / 1

Job No. : DACW39-94-M-5062

Client: WES



SOUNDING DATA IN FILE SND-94 06-27-94 21:24

OPERATOR : S.VAN

LOCATION : P-9/BFC-KC MO

CLIENT : WES

JOB No. : DACW39-94-M-5062

Vandehey Soil Exploration

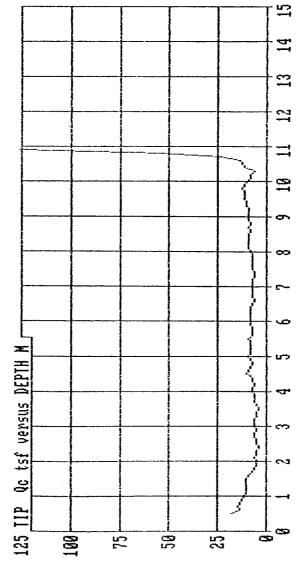
40695 Nw Pacific Ave. Banks, Oregon. 97106 (503) 324 3261

DEPTH	DEPTH	TIP	FRICTION	FR RATIO	INC	INTERPRETED
meters	fest	Qc tsf	Fs tsf	Fs/Qc ≱	I deg	SOIL TYPE
0.50	1.6	17.3	0.270	5.04	0.0	?
0.60	2.0	13.6	0.517	3.80	0.0	clay
0.70	2.3	14.7	0.574	3.91	0.0	silty clay to clay
0.80	2.8	13.9	0.565	4.08	0.0	clay
0.90	3.0	12.6	0.446	3.59	0.0	silty clay to clay
1.00	3.3	11.1	0.408	3.67	0.0	silty clay to clay
1.10	3.€	10.6	0.357	3.38	0.0	silty clay to clay
1.20	3.9	10.6	0.343	3.24	0.0	silty clay to clay
1.30	4.3	9.9	0.298	2.98	0.0	silty clay to clay
1.40	4.8	9.9	0.335	3.37	0.0	silty clay to clay
1.50	4.9	10.0	0.272	2.73	0.0	silty clay to clay
1.50	5.2	9.0	0.200	2.22	0.0	silty clay to clay
1.70	5.6	7.7	0.151	1.96	0.0	silty clay to clay
1.80	5.9	6.6	0.120	1.82	0.0	silty clay to clay
1.90	6.2	5.5	0.089	1.62	0.0	sensitive fine grained
2.00	6.6	5.6	0.071	1.27	0.0	sensitive fine grained
2.10	6.9	5.9	0.084	1.43	0.0	sensitive fine grained
2.20	7.2	5.7	0.107	1.88	0.0	sensitive fine grained
2.30	7.5	5.1	0.071	1.39	0.0	sensitive fine grained
2.40	7.9	4.5	0.069	1.52	0.0	sensitive fine grained
2.50	8.2	4.7	0.060	1.29	0.0	sensitive fine grained
2.60	8.5	5.4	0.078	1.45	0.0	sensitive fine grained
2.70	8.9	6.5	0.100	1.56	0.0	sensitive fine grained
2.90	9.2	6.1	0.100	1.64	0.0	silty clay to clay
2.50	9.5	5.6	0.095	1.70	0.0	sensitive fine grained
3.60	9.8	6.3	0.082	1.29	0.0	sensitive fine grained
3.10	10.2	6.5	0.113	1.75	0.0	silty clay to clay
3.20	10.5	5.8	0.095	1.63	0.0	sensitive fine grained
3.30	10.8	5.0	0.078	1.54	0.0	sensitive fine grained
3.40	11.2	4.7	0.078	1.66	0.0	sensitive fine grained
3.50	11.5	4.6	0.059	1.29	0.0	sensitive fine grained
3.60	11.8	4.9	0.050	1.02	Ú.0	sensitive fine grained
3.70	12.1	5.9	0.060	1.02	0.0	sensitive fine grained
3.80	12.5	6.4	0.088	1.39	0.0	sensitive fine grained
3.90	12.8	6.6	0.097	1.47	0.0	sensitive fine grained
4.00	13.1	7.6	0.120	1.56	0.0	clayey silt to silty clay
4.10	13.5	7.2	0.115	1.50	0.0	clayey silt to silty clay
4.20	13.8	6.7	0.097	1.30	0.0	sensitive fine grained
4.30	14.1	7.1	380.0	1.21	0.0	silty clay to clay
4.40	14.4	7.2	0.221	3.06	0.0	silty clay to clay

DEPTH	DÉPTH	TIP	FRICTION	FR RATIO	INC	INTERPRETED
meters	feet	Qc tsf	Fs tsf	Fs/Qc 4	ĭdeg	SOIL TYPE
mc 0 C 1 D		40 001			- 4-5	
4.50	14.8	10.5	0.275	2.63	0.0	silty clay to clay
4.60	15.1	9.7	0.178	1.84	0.0	clayey silt to silty clay
4.70	15.4	7.9	0.187	2.36	0.0	silty clay to clay
4.80	15.7	7.4	0.158	2.14	0.0	silty clay to clay
					0.0	
4.90	16.1	8.8	0.214	2.44		silty clay to clay
5.00	16.4	9.7	0.248	2.53	0.0	silty clay to clay
5.10	16.7	8.8	0.177	2.02	0.0	silty clay to clay
5.20	17.1	6.1	0.170	2.03	0.0	silty clay to clay
5.30	17.4	8.5	0.163	1.91	0.0	silty clay to clay
5.40	17.7	8.4	0.167	i.98	0.0	clayey silt to silty clay
5.50	16.0	9.3	0.157	1.70	0.0	clayey silt to silty clay
5.60	18.4	7.6	0.071	0.93	0.0	clayey silt to silty clay
5.70	18.7	7.3	0.050	0.69	0.0	sensitive fine grained
5.80	19.0	7.4	0.056	0.75	0.0	sensitive fine grained
5.90	19.4	8.0	0.067	0.84	0.0	sensitive fine grained
6.00	19.7	8.5	0.089	1.09	0.0	clayey silt to silty clay
€.10	20.0	8.2	0.098	1.19	0.0	clayey silt to silty clay
€.20	20.3	8.0	0.115	1.44	0.0	clayey silt to silty clay
6.30	20.7	1.8	0.124	1.53	0.0	clayey silt to silty clay
6.40	21.0	8.0	0.125	1.56	0.0	clayey silt to silty clay
6.50	21.3	7.6	0.137	1.80	0.0	clayey silt to silty clay
6.60	21.7	6.8	0.084	1.24	0.0	clayey silt to silty clay
6.70	22.0	7.3	0.079	1.09	0.0	sensitive fine grained
6.80	22.3	7.0	0.084	1.19	0.0	sensitive fine grained
6.90	22.6	7.1	0.078	1.07	0.0	sensitive fine grained
7.00	23.0	6.8	0.054	0.80	0.0	sensitive fine grained
7.10	23.3	6.9	0.041	0.59	0.0	
7.20	23.5	7.0				sensitive fine grained
7.30			0.039	0.56	0.0	sensitive fine grained
	23.9	6.3	0.027	0.42	0.0	sensitive fine grained
7.40	24.3	6.2	0.074	1.20	0.0	sensitive fine grained
7.50	24.6	7.3	0.043	0.59	0.0	sensitive fine grained
7.60	24.9	7.4	0.050	0.68	0.0	sensitive fine grained
7.70	25.3	6.9	0.036	0.52	0.0	sensitive fine grained
7.80	25.€	6.8	0.041	0.61	0.0	sensitive fine grained
7.90	25.9	7.2	0.075	1.04	0.0	sensitive fine grained
8.00	26.2	8.4	0.143	1.70	0.0	clayey silt to silty clay
8.10	26.6	8.9	0.181	2.02	0.0	clayey silt to silty clay
8.20	26.9	9.8	0.209	2.13	0.0	clayey silt to silty clay
8.30	27.2	9.6	0.203	2.11	0.0	clayey silt to silty clay
8.40	27.6	9.6	0.205	2.15	0.0	clayey silt to silty clay
8.50	27.9	9.1	0.167	1.83	0.0	clayey silt to silty clay
8.60	28.2	8.8	0.135	1.57	0.0	clayey silt to silty clay
9.70	28.5	8.9	0.123	1.38	0.0	clayey siit to silty clay
8.80	<b>28.</b> 9	8.4	0.177	2.12	0.0	clayey silt to silty clay
8.90	29.2	9.6	0.219	2.28	0.0	silty clay to clay
9.00	29.5	9.5	0.222	2.33	0.0	silty clay to clay
9.10	29.9	9.7	0.203	2.09	0.0	silty clay to clay
9.20	30.2	9.8	0.254	2.59	0.0	silty clay to clay
9.30	30.5	10.9	0.296	2.71	0.0	silty clay to clay
9.40	30.8	10.2	0.266	2.61	0.0	silty clay to clay
J.TV	20.0	10.2	4.700	1.01	V.0	Direy City to ticy

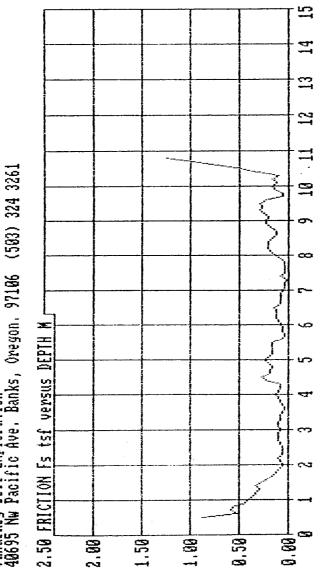
DEPTH	DEPTH	TIP	FRICTION	FR RATIO	INC	INTERPRETED
meters	fect	Qc tsf	Fs tsf	Fs/Qc ≇	I deg	SOIL TYPE
-						
9.50	31.2	11.3	0.292	2.59	0.0	silty clay to clay
9.50	31.5	11.1	0.234	2.11	0.0	clayey silt to silty clay
9.70	31.8	11.6	0.067	0.59	0.0	sandy silt to clayey silt
9.80	32.2	12.5	0.066	0.53	0.0	sandy silt to clayey silt
9.90	32.5	11.1	0.142	1.28	0.0	clayey silt to silty clay
10.00	32.8	10.8	0.170	1.50	0.0	clayey silt to silty clay
16.10	33.1	8.8	0.116	1.33	0.0	clayey silt to silty clay
10.20	33.5	9.8	0.174	1.99	0.0	clayey silt to silty clay
10.30	33.8	5.5	0.103	1.60	0.0	silty clay to clay
10.40	34.1	11.7	0.308	2.75	0.0	silty clay to clay
10.50	34.4	12.2	0.485	3.98	0.0	clay
10.90	34.8	13.9	0.733	5.28	0.0	clay
10.70	35.1	23.7	0.983	*.15	0,0	clayey silt to silty clay
03.01	35.4	52.8	1.249	2.37	0.0	•
10.90	35.8	142.8	7	7	9.0	?

SOUNDING DATA IN FILE SND-94 G6-27-94 21:24
OPERATOR: S.UAN
CLIENT: WES
JOB No.: DACW39-94-M-5062

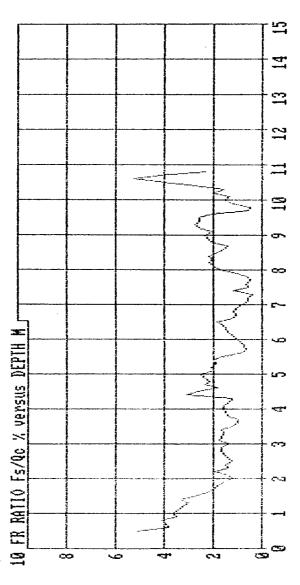


SOUNDING DATA IN FILE SND-94 G6-27-94 21:24
OPERATOR: S.UAN
LOCATION: P-9/BFC-KC MO
CLIENT: WES
JOB No. : DACH39-94-M-5062

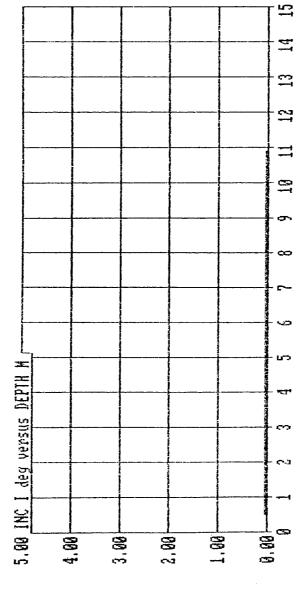
	324
	(593)
	97106
	Oregon,
tion	Banks,
Exploration	c Ave, I
ney Soil Exy	Pacific
Vandehey	48695 NW



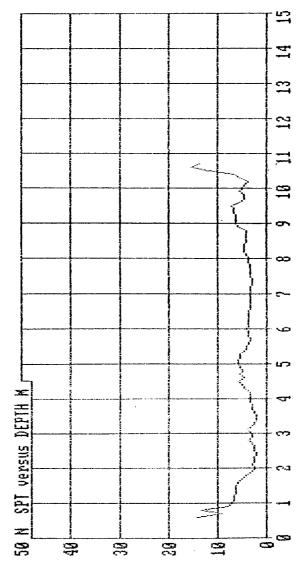
SOUNDING DATA IN FILE SND-94 86-27-94 21:24
OPERATOR: S.UAN
CLIENT: WES
JOB NO. : DACW39-94-M-5862



SOUNDING DATA IN FILE SND-94 06-27-94 21:24
OPENATOR: S.UAN
CLIENT: HES
JOB NO.: DACH39-94-M-5862



SOUNDING DATA IN FILE SND-94 86-27-94 21:24
OPERATOR: S.UAN
CLIENT: HES
JOB NO. : DACH39-94-M-5862



SCPT P-10

Vandehey Soil Expl.

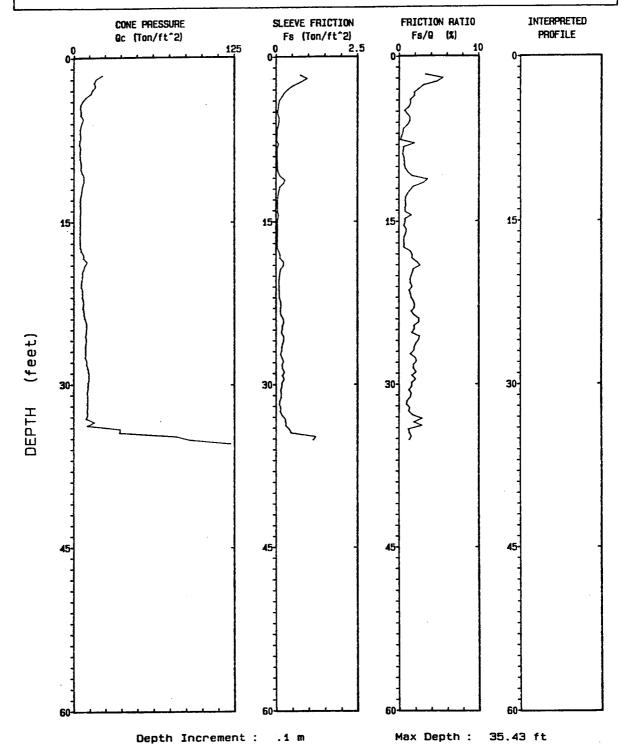
Operator : S.VAN

Sounding: SND-95 Pg 1 / 1

Client: WES

CPT Date: 06-28-94 16:09 Location: P-10BFC-KC M0

Job No. : DACW39-94-M-5062



SOUNDING DATA IN FILE SND-95 06-28-94 16:09

OPERATOR : S.VAN

LOCATION : P-10BFC-KC MO

CLIENT : WES

JOB No. : DACW39-94-M-5062

Vandehey Soil Exploration

40695 Nw Pacific Ave. Banks, Oregon. 97106 (503) 324 3261

	DEPTH	TIP	FRICTION	FR RATIO	INC	INTERPRETED
meters	feet	Qc tsf	Fs tsf	Fs/Qc ≱	I deg	SOIL TYPE
0.50	1.6	22.6	0.760	3.36	0.3	
0.50		17.5	0.962	5.48	0.3	clay
0.70	2.3	16.0	0.755	4.71	1.0	clay
08.0	2.6	17.4	0.518	2.98	0.1	silty clay to clay
0.90	3.0	14.7	0.359	2.44	0.1	clayey silt to silty clay
1.00	3.3	13.4	0.245	1.83	0.1	clayey silt to silty clay
1.10	3.6	9.5	0.176	1.86	0.1	clayey silt to silty clay
1.20	3.9	7.0	0.095	1.36	0.1	clayey silt to silty clay
1.30	4.3	5.4	0.076	1.41	0.1	sensitive fine grained
1.40	4.6	5.1	0.060	1.18	0.1	sensitive fine grained
1.50	4.9	5.9	0.038	0.64	0.1	sensitive fine grained
1.50	5.2	5.6	0.060	1.06	0.1	sensitive fine grained
1.70	5.6	7.5	0.103	1.38	0.1	sensitive fine grained
1.80	5.9	6.2	0.080	1.28	0.1	sensitive fine grained
1.90	6.2	5.4	0.054	0.98	0.1	sensitive fine grained
2.00	6.6	4.8	0.023	0.47	0.1	sensitive fine grained
2.10	6.9	4.9	0.022	0.44	0.1	sensitive fine grained
2.20	7.2	5.5	0.015	0.28	0.1	sensitive fine grained
2.30	7.5	4.6	300.0	0.14	0.1	sensitive fine grained
2.40	7.9	4.2	0.081	1.94	0.1	sensitive fine grained
2.50	8.2	5.4	0.028	0.51	0.0	sensitive fine grained
2.60	8.5	4.7	0.023	0.48	0.0	sensitive fine grained
2.70	8.9	4.7	0.020	0.42	0.0	sensitive fine grained
2.80	9.2	4.8	0.030	0.63	0.0	sensitive fine grained
2.90	9.5	5.7	0.038	0.68	0.0	sensitive fine grained
3.00	9.8	5.8	0.039	. 0.67	0.0	sensitive fine grained
3.10	10.2	5.4	0.044	0.81	0.0	sensitive fine grained
3.20	10.5	8.5	0.074	1.13	0.0	sensitive fine grained
3.30	10.8	8.1	0.133	1.65	0.0	silty clay to clay
3.40	11.2	7.7	0.274	3.57	0.0	silty clay to clay
3.50	11.5	7.3	0.219	2.99	0.0	clay
3.60	11.8	6.3	0.109	1.73	0.0	silty clay to clay
3.70	12.1	6.1	0.084	1.37	0.0	sensitive fine grained
3.80	12.5	5.6	0.057	1.01	0.0	sensitive fine grained
3.90	12.8	5.2	0.040	0.77	0.0	sensitive fine grained
4.00	13.1	4.8	0.035	0.72	0.0	sensitive fine grained
4.10 4.20	13.5	5.0	0.043	0.85	0.0	sensitive fine grained
4.20	13.8 14.1	5.4	0.038	0.71	0.0	sensitive fine grained
4.40	19.1 14.4	5.3 4.8	0.040	0.75	0.0	sensitive fine grained
7.70	17.7	4.5	0.075	1.55	0.0	sensitive fine grained

	* ***	POTATION	ED DATIO	INC	INTERPRETED
DEPTH DEPTH		FRICTION Fs tsf	Fs/Qc 2	I deg	SOIL TYPE
meters feet	Qc tsf	ra (3)	13740 4	1 dog	OUL THE
4.50 14.6	5.2	0.037	0.71	0.0	sensitive fine grained
4.60 15.1		0.033	0.68	0.0	sensitive fine grained
4.70 15.4		0.030	0.59	0.0	sensitive fine grained
4.80 15.7		0.044	0.92	0.0	sensitive fine grained
4.90 16.1		0.040	0.81	0.0	sensitive fine grained
5.00 16.4		0.028	0.61	0.0	sensitive fine grained
5.10 16.7		0.025	0.53	0.0	sensitive fine grained
5.20 17.1		0.031	0.63	0.0	sensitive fine grained
5.30 17.4		0.031	0.59	0.0	sensitive fine grained
5.40 17.7		0.084	1.41	0.0	sensitive fine grained
5.50 18.0		0.128	1.65	0.0	clayey silt to silty clay
5.60 18.4		0.125	1.60	0.0	clayey silt to silty clay
5.76 18.3		0.232	2.21	0.0	silty clay to clay
5.80 19.0		0.224	2.62	0.0	silty clay to clay
5.90 19.4		0.133	1.76	0.0	silty clay to clay
6.00 15.7		0.107	1.62	0.0	silty clay to clay
6.10 20.0		0.098	1.4€	0.0	sensitive fine grained
6.20 20.3		0.083	1.34	0.0	sensitive fine grained
6.30 20.3		0.081	1.42	0.0	sensitive fine grained
6.40 2i.0		0.095	1.63	0.0	sensitive fine grained
6.50 21.		0.087	1.24	0.0	sensitive fine grained
6.60 21.		0.099	1.44	0.0	sensitive fine grained
6.70 22.0		0.101	1.50	0.0	clavev silt to silty clay
6.80 22.5		0.134	1.78	0.0	silty clay to clay
6.90 22.1		0.149	1.93	0.0	silty clay to clay
7.00 23.1		0.130	1.86	0.0	silty clay to clay
7.10 23.		0.119	1.49	0.0	clayey silt to silty clay
7.20 23.4		0.155	1.89	0.0	silty clay to clay
7.30 23.5		0.221	2.49	0.0	silty clay to clay
7.40 24.5		0.240	2.44	0.0	silty clay to clay
7.50 24.		0.189	1.83	0.0	clayey silt to silty clay
7.60 24.1		0.183	1.86	0.0	clayey silt to silty clay
7.70 25.	-	0.153	1.58	0.0	clayey silt to silty clay
7.80 25.		0.233	2.57	0.0	silty clay to clay
7.90 25.			2.40	0.0	silty clay to clay
8.00 26.				0.0	clayey silt to silty clay
8.00 26. 8.10 26.				0.0	clayey silt to silty clay
				0.0	clayey silt to silty clay
8.20 26.			1.38	0.0	clayey silt to silty clay
8.30 27.				0.0	clayey silt to silty clay
8.40 27.				0.0	clayey silt to silty clay
8.50 27.				0.0	
8.60 28.					
8.70 28.				0.0	clayey silt to silty clay clayey silt to silty clay
8,80, 28.				0.0	• •
8.90 29.				0.0	
9.00 29.				0.0	
9.10 29.				0.0	• •
9.20 30.				0.0	
9.30 30.				0.0	
9.40 30.	8 10.4	0.159	1.53	0.0	clayey silt to silty clay

SND-95 : P-10BFC-KC MO : 06-28-94 16:09 PAGE 3

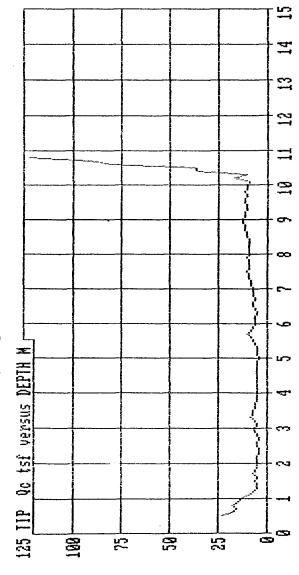
DEPTH	DEPTH	TIP	FRICTION	FR RATIO	INC	INTERPRETED
meters	feet	Qc tsf	Fs tsf	Fs/Ųc ≇	I deg	SOIL TYPE
9.50	31.2	11.1	0.153	1.37	0.1	clayey silt to silty clay
9.60	31.5	10.9	0.106	0.97	0.1	clayey silt to silty clay
9.70	31.8	10.6	0.092	0.87	0.1	clayey silt to silty clay
9.80	32.2	11.0	0.144	1.32	0.1	clayey silt to silty clay
9.90	32.5	10.5	0.123	1.17	0.1	clayey silt to silty clay
10.60	32.8	10.9	0.182	1.67	0.1	clayey silt to silty clay
10.10	33.1	3.6	0.278	2.88	0.1	clayey silt to silty clay
10.20	33.5	16.4	0.301	1.83	0.0	clayey silt to silty clay
10.30	33.8	10.7	0.305	2.86	0.0	sandy silt to clayey silt
10.40	34.1	36.8	9.415	1.13	0.0	sandy silt to clayey silt
10.50	34.4	36.8	0.474	1.30	0.0	silty sand to sandy silt
10.60	34.8	80.1	1.227	i.53	0.0	silty sand to sandy silt
10.70	35.1	91.4	1.139	1.29	0.1	?
10.80	35.4	122.2	?	?	0.1	?

SOUNDING DATA IN FILE SND-95 06-28-94 16:09

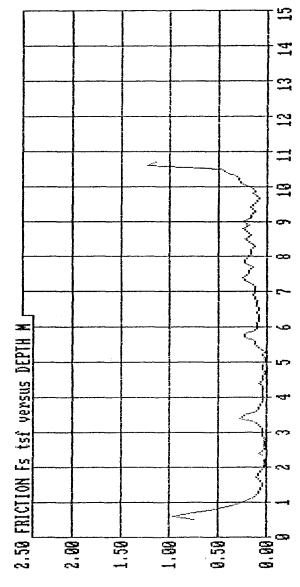
OPERATOR: S.UAN

CLIENT: WES

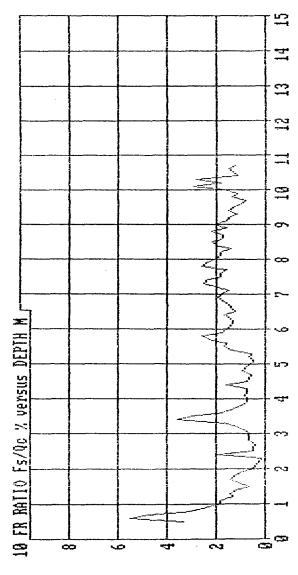
JOB No.: DACU39-94-M-5062



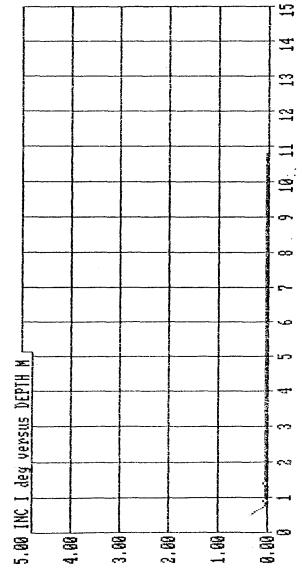
SOUNDING DATA IN FILE SND-95 86-28-94 16:09
OPERATOR: S.UAN
CLIENT: HES
JOB No. : DACH39-94-M-5062



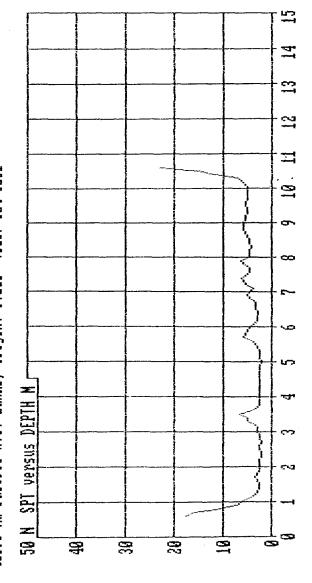
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OPERATOR: S.UAN
LOCATION: P-10BFC-KC MO
CLIENT: HES
JOB No.: DACH39-94-M-5062



SOUNDING DATA IN FILE SND-95 06-28-94 16:09
OPERATOR: S.UAN
CLIENT: WES
JOB No.: DACH39-94-M-5062



SOUNDING DATA IN FILE SND-95 86-28-94 16:89
OPERATOR: S.UAN
LOCATION: P-18BFC-KC MO
CLIENT: HES
JOB No. : DACH39-94-M-5862



SCPT P-11

Vandehey Soil Expl

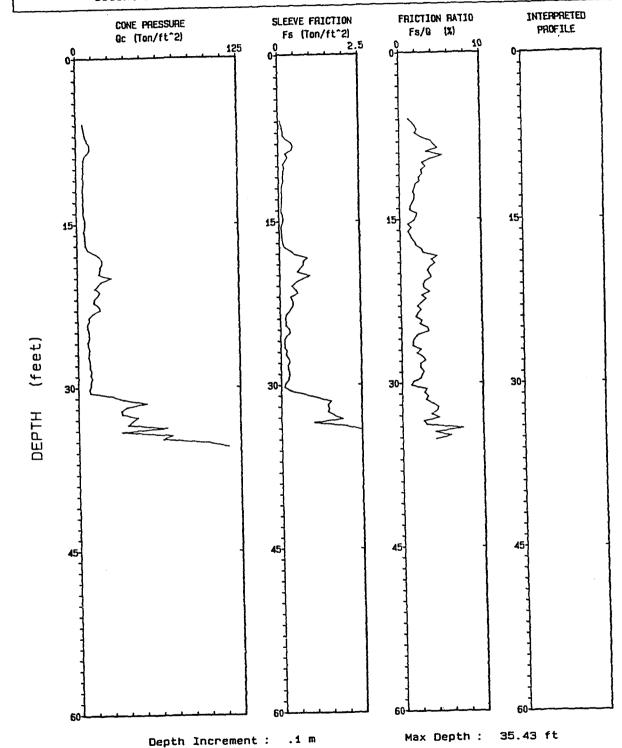
Operator : S.VAN

Sounding: SND-97 Pg 1 / 1

Client: WES

CPT Date: 06-28-94 19:36 Location: P-11/BFC-KC MO

Job No. : DACW39-94-M-5062



SOUNDING DATA IN FILE SND-97 06-28-94 19:36

OPERATOR : S.VAN

LOCATION: P-11/BFC-KC MO

CLIENT : WES

JOB No. : DACW39-94-M-5062

Vandehey Soil Exploration

40695 Nw Pacific Ave. Banks, Oregon. 97106 (503) 324 3261

NEDTU	DEPTH	TJP	FRICTION	FR RATIO	INC	INTERPRETED
	feet	Qc tsf	Fs tsf	Fs/Qc ‡	I deg	SOIL TYPE
#eter5	reet	ŲC ESI	rs t51	F57ŲC 4	1 deg	2017 LLE
1.80	5.9	5.0	0.057	1.14	0.1	?
1.90	6.2	5.5	0.088	1.61	0.1	sensitive fine grained
2.00	8.8	6.1	0.117	1.92	0.1	silty clay to clay
2.10	6.3	8.3	0.148	2.18	0.0	silty clay to clay
2.20	7.2	7.5	0.143	1.92	0.0	silty clay to clay
2.30	7.5	8.8	0.241	2.74	0.1	silty clay to clay
2.40	7.9	10.7	0.415	3.89	0.0	, clay
2.50	8.2	10.7	0.460	4.27	0.0	clay
2.60	8.5	8.8	0.409	4.74	0.0	clay
2.70	8.9	6.1	0,204	3.34	0.0	clay
2.80	9.2	5.4	0.290	5.34	0.0	clay
2.90	9.5	5.8	0.215	3.85	0.0	clay
3.00	9.8	5.0	0,139	2.80	0.0	clay
3.10	10.2	5.4	0.175	3.24	0.0	clay
3.20	10.5	5.4	0.146	2.69	0.0	clay
3.30	10.8	4.7	0.134	2.84	0.0	clay
3.40	11.2	5.€	0.133	2.39	0.0	ciay
3.50	11.5	4.8	0.120	2.47	0.0	clay
3.60	11.8	4.9	0.095	1.95	0.0	silty clay to clay
3.70	12.1	4.7	0.086	1.83	0.0	silty clay to clay
3.80	12.5	5.0	0.083	1.66	0.0	silty clay to clay
3.90	12.8	5.2	0.098	1.87	0.0	silty clay to clay
4.00	13.1	5.2	0.094	1.80	0.0	silty clay to clay
4.10	13.5	5.3	0.082	1.55	0.0	sensitive fine grained
4.20	13.8	5.4	0.071	1.33	0.0	sensitive fine grained
4.30	14.1	5.4	830.0	1.24	0.0	sensitive fine grained
4.40	14.4	5.8	0.126	2.16	0.0	silty clay to clay
4.50	14.8	8.8	0.131	1.98	0.1	silty clay to clay
4.60	15.1	6.3	0.105	1.67	0.1	silty clay to clay
4.70	15.4	5.9	0.058	0.97	0.1	sensitive fine grained
4.80	15.7	5.1	0.075	1.45	0.1	sensitive fine grained
4.90	16.1	5.9	0.057	0.95	0.1	sensitive fine grained
5.00	16.4	0.3	0.072	1.20	0.1	sensitive fine grained
5.10	16.7	6.5	0.095	1.46	0.1	sensitive fine grained
5.20	17.1	€.7	0.121	1.80	0.0	silty clay to clay
5.30	17.4	8.2	0.163	1.98	0.1	silty clay to clay
5.40	17.7	13.1	0.344	2.63	6.1	clayey silt to silty clay
5.50	18.0	17.2	0.495	2.87	0.1	silty clay to clay
5.60	18.4	19.3	0.884	4.59	0.0	silty clay to clay
5.70	18.7	19.1	0.731	3.84	0.0	silty clay to clay

Soil interpretation reference: Robertson & Campanella-1983, based on 60% hammer efficiency and .2 m sliding data average

					7116	INTERPRETED
DEPTH		TIP	FRICTION	FR RATIO	INC	SOIL TYPE
<b>s</b> eters	feet	Qc tsf	Fs tsf	Fs/Qc Z	I deg	SUIL TIFE
5.80	19.0	17.2	0.733	4.26	0.0	silty clay to clay
5.90		17.6	0.639	3.64	0.0	silty clay to clay
6.00		16.7	0.554	3.32	0.0	silty clay to clay
6.10		26.1	0.944	3.62	0.0	silty clay to clay
6.20		18.3	0.690	3.77	0.0	silty clay to clay
6.30		16.1	0.483	3.00	0.0	silty clay to clay
6.40		13.5	0.377	2.79	0.0	clayey silt to silty clay
6.50		17.1	0.495	2.89	0.1	clayey silt to silty clay
6.60		.15.4	0.557	3.61	0.1	silty clay to clay
6.70		12.9	0.336	2.60	0.1	silty clay to clay
6.80		12.4	0.392	3.15	0.1	clayey silt to silty clay
6.90		16.4	0.410	2.50	0.1	clayey silt to silty clay
7.00		17.5	0.356	2.04	0.1	clayey silt to silty clay
7.10		11.5	0.289	2.51	0.1	clayey silt to silty clay
7.20		8.7	0.180	2.07	0.1	clayey silt to silty clay
7.30		8.5	0.152	1.78	0.1	silty clay to clay
7.40			0.183	2.61	0.1	silty clay to clay
7.50		7.5	0.174	2.31	0.1	silty clay to clay
7.60			0.274	3.26	0.1	clay
7.70		8.8	0.291	3.36	0.1	silty clay to clay
7.80		8.7	0.171	1.97	0.1	silty clay to clay
7.90	25.9	7.3	0.116	1.59	0.1	clayey silt to silty clay
8.00		7.7	0.105	1.36	0.1	clayey silt to silty clay
8.10		8.9	0.123	1.37	0.1	clayey silt to silty clay
8.20	26.9	8.4	0.204	2.44	0.1	silty clay to clay
8.30	27.2	7.8	0.147	1.88	0.1	silty clay to clay
8.40	27.6	8.9	0.229		0.1	silty clay to clay
8.50	27.9	9.2	0.270	2.94	0.1	silty clay to clay
8.8	28.2	9.3	0.212	2.29	0.1	silty clay to clay
8.70	28.5	10.3	0.238	2. <b>3</b> 0	0.1	silty clay to clay
8.8	0 28.9	9.3	0.254	2.72	0.1	silty clay to clay
8.9	0 29.2	10.6	0.266	2.51	0.1	silty clay to clay
9.0	0 29.5	9.5	0.219	2.31	0.1	clayey silt to silty clay
9.1	0 29.9	9.5	0.129	1.35	0.1	clayey silt to silty clay
9.2	0 30.2	8.3	0.092	1.11	0.1	clayey silt to silty clay
9.3	0 30.5	9.4	0.290		0.1	clayey silt to silty clay
9.4	0 30.8	26.6	0.742		0.1	clayey silt to silty clay
9.5	0 31.2	35.3			0.1	clayey silt to silty clay
9.6					0.1	clayey silt to silty clay
9.7					0.1	clayey silt to silty clay
9.8	0 32.2					silty clay to clay
9.9						silty clay to clay
10.0						clayey silt to silty clay
. 10.1						
10.2						
10.3						
10.4						
10.5						
10.6						very stiff fine grained (*)
10.7	70 35.	1 101.1	8 4.22	5 4.15	0.2	?

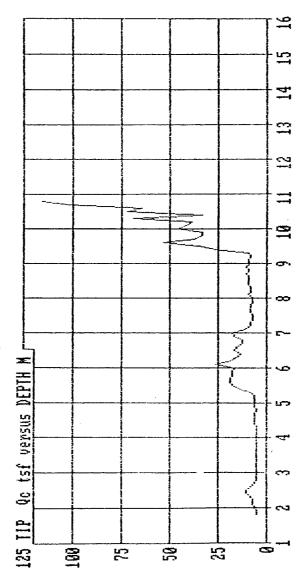
Soil interpretation reference: Robertson & Campanella-1983, based on 80% hammer efficiency and .2 m sliding data average

SND-97 : P-11/BFC-KC MO : 06-28-94 19:36 PAGE 3

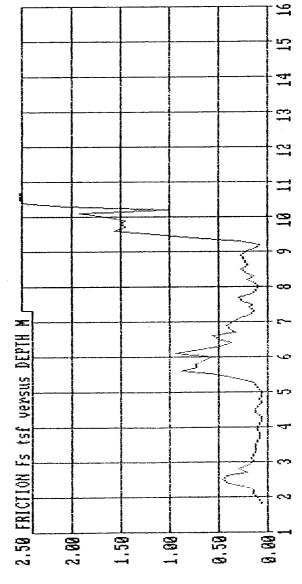
DEPTH DEPTH TIP FRICTION FR RATIO INC INTERPRETED meters feet Qc tsf Fs tsf Fs/Qc 2 I deg SOIL TYPE

10.80 35.4 115.6 ? ? 0.2 ?

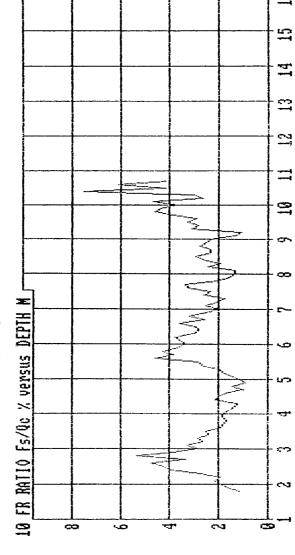
SOUNDING DATA IN FILE SND-97 G6-28-94 19:36
OPERATOR: S.UAN
LOCATION: P-11/BFC-KC MO
CLIENT: WES
JOB No. : DACH39-94-M-5962



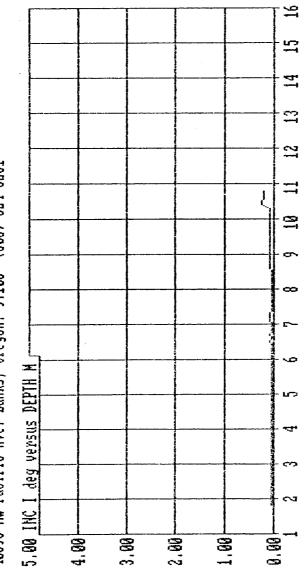
SOUNDING DATA IN FILE SND-97 06-28-94 19:36
OPERATOR: S.UAN
CLIENT: WES
JOB No.: DACH39-94-M-5062



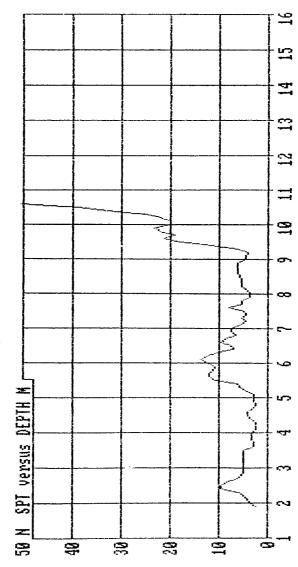
SOUNDING DATA IN FILE SND-97 86-28-94 19:36
OPERATOR: S.UAN
LOCATION: P-11/BFC-KC MO
CLIENT: WES
JOB No.: DACH39-94-M-5862



SOUNDING DATA IN FILE SND-97 86-28-94 19:36
OPERATOR: S.UAN
CLIENT: KES
JOB No. : DACH39-94-M-5862



SOUNDING DATA IN FILE SND-97 66-28-94 19:36
OPERATOR: S.UAN
LOCATION: P-11/BFC-KC MO
CLIENT: WES
JOB No.: DACW39-94-M-5862



SCPT P-12

Vandehey Soil Expl.

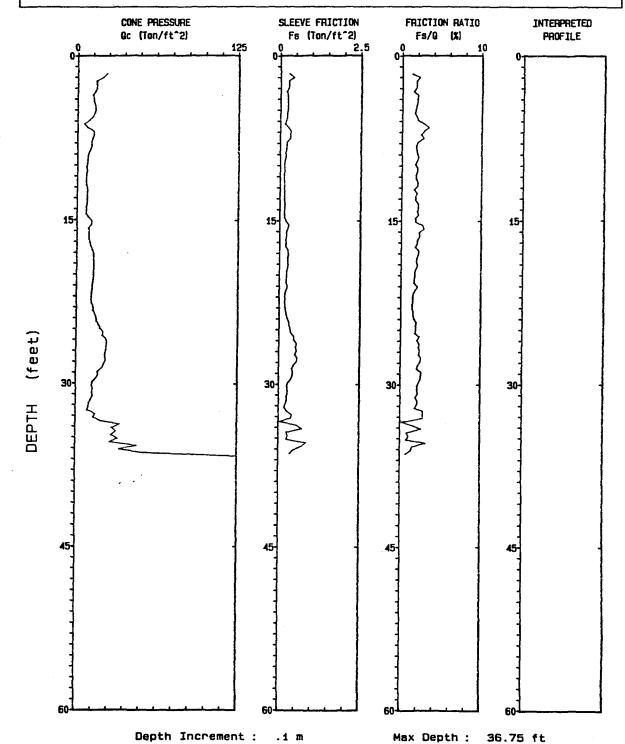
Operator : S.VAN

Sounding: SND109 Pg 1 / 1

Client : WES

CPT Date : 06-30-94 20:07 Location : P-12/BFC-KC-MO

Job No. : DACW39-94-M-5062



SOUNDING DATA IN FILE SND109 06-30-94 20:07

OPERATOR : S.VAN

LOCATION : P-12/BFC-KC-MO

CLIENT : WES

JOB No. : DACW39-94-M-5062

Vandehey Soil Exploration

40695 Nw Pacific Ave. Banks, Oregon. 97106 (503) 324 3261

DEPTH	DEPTH	TIP	FRICTION	FR RATIO	INC	INTERPRETED
meter	s feet	Qc tsf	Fs tisf	Fs/Qc ≩	I deg	SOIL TYPE
0.5		22.8	0.278	1.23	0.0	3
0.8		19.6	0.421	2.15	0.0	sandy silt to clayey silt
6.7		14.6	0.253	1.73	0.1	clayey silt to silty clay
0.8		14.5	0.259	1.73	0.1	, ,,
0.9		14.6	0.242	1.65	0.1	clayey silt to silty clay
1.0		13.4	0.180	1.34	0.1	clayey silt to silty clay
1.1		11.6	0.230	1.99	0.1	clayey silt to silty clay
1.2		12.5	0.234	1.87	0.0	clayey silt to silty clay
1.3		12.7	0.235	1.85	0.0	
1.4		13.€	0.236	1.73	0.1	clayey silt to silty clay
1.5		13.9	0.226	1.62	0.1	clayey silt to silty clay
1.6		13.2	0.203	1.54	0.1	clayey silt to silty clay
1.70		11.8	0.219	1.85	0.0	clayey silt to silty clay
1.80		9.1	0.181	2.00	0.1	silty clay to clay
1.90		5.1	0.138	2.71	0.1	silty clay to clay
2.00		7.6	0.255	3.33	0.1	silty clay to clay
2.10		12.2	0.330	2.70	1.0	silty clay to clay
2.20		13.0	0.310	2.38	0.1	clayey silt to silty clay
2.30		11.7	0.317	2.71	0.1	clayey silt to silty clay
2.40		10.7	0.204	1.91	0.1	clayey silt to silty clay
2.50		11.2	0.195	1.74	0.1	clayey silt to silty clay
2.60		10.0	0.182	1.92	0.i	clayey silt to silty clay
2.70		8.5	0.169	1.99	0.1	clayey silt to silty clay
2.60		7.9	0.165	2.07	0.1	silty clay to clay
2.90		7.5	0.141	1.87	0.1	silty clay to clay
3.00		7.3	0.120	1.63	0.1	silty clay to clay
3.10		6.9	0.133	1.53	0.1	silty clay to clay
3.20		7.5	0.140	1.88	0.1	silty clay to clay
3.30		6.9	0.122	1.75	0.1	silty clay to clay
3.40		6.7	0.120	1.80	0.1	silty clay to clay
3.50		€.€	0.132	2.01	1.0	silty clay to clay
3.60	11.6	7.1	0.135	1.92	0.1	silty clay to clay
3.70	12.1	7.9	0.117	1.49	0.1	clayey silt to silty clay
3.80	12.5	7.8	0.151	1.93	0.1	clayey silt to silty clay
3.90	12.8	7.8	0.133	1.72	0.1	clayey silt to silty clay
4.60	13.1	7.6	0.134	1.77	0.1	silty clay to clay
4.10	13.5	7.6	0.151	7.11	0.1	silty clay to clay
4.20	13.8	6.8	0.140	2.05	0.1	silty clay to clay
4.30	14.1	8.3	0.133	1.95	0.1	silty clay to clay
4.40	14.4	7.2	0.153	2.13	0.1	silty clay to clay

Soil interpretation reference: Robertson & Campanelia-1983, based on 60% hammer efficiency and .2 m sliding data average

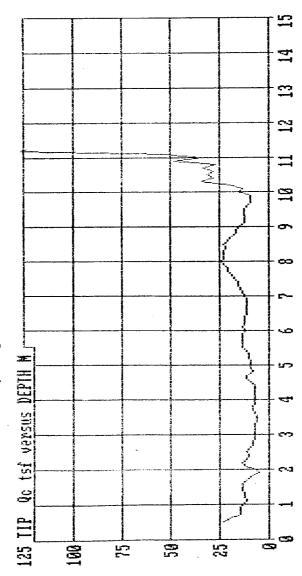
. FRS.		~~r	PRIATION	EE DATID	1110	TUTERORFTER
DEPTH		TIF	FRICTION		INC	INTERPRETED
meters.	feet	Qc tsf	Fs tsf	Fs/Qc 4	I deg	SOIL TYPE
4.50	14.8	9.1	0.155	1.70	0.2	clayey silt to silty clay
4.60	15.1	11.6	0.210	1.81	0.2	clayey silt to silty clay
4.70	15.4	11.0	0.291	2.65	0.2	silty clay to clay
4.80	15.7	8.7	0.243	2.80	0.2	silty clay to clay
4.90	16.1	9.3	0.204	2.20	0.2	silty clay to clay
5.00	15.4	9.1	0.207	2.27	0.2	silty clay to clay
5.10	16.7	9.3	6.183	1.96	0.2	clayey silt to silty clay
5.20	17.1	10.1	0.135	1.92	0.2	clayey silt to silty clay
5.30	17.4	10.7	0.182	1.70	0.2	crayey silt to silty clay
5,40	17.7	11.8	0.261	2.21	0.4	clayey silt to silty clay
5.50	18.0	13.3	0.280	2.10	0.3	clayey silt to silty clay
5.80	15.4	13.2	6.255	1.93	0.3	clayey silt to silty clay
5.70	18.7	13.2	0.244	1.85	0.3	clayey silt to silty clay
5.80	19.0	13.3	0.2€8	2.02	0.5	clayey silt to silty clay
5.90	19.4	13.2	0.240	1.82	0.4	clayey silt to silty clay
€.00	19.7	13.0	0.219	1.69	0.4	clayey silt to silty clay
8.10	20.0	13.3	0.223	1.68	0.4	clayey silt to silty clay
6.20	20.3	12.9	0.210	1.63	0.5	clayey silt to silty clay
6.30	20.7	12.4	0.197	1.58	0.5	clayey silt to silty clay
6.40	21.0	12.0	0.247	2.05	0.5	clayey silt to silty clay
B.50	21.3	11.9	0.209	1.75	0.6	clayey silt to silty clay
6.60	21.7	11.8	0.174	1.50	0.6	clayey silt to silty clay
6.70	22.0	11.4	0.165	1.45	0.6	clayey silt to silty clay
6.80	22.3	11.2	0.167	1.49	0.6	clayey silt to silty clay
6.90	22.5	11.9	0.165	1.38	0.9	clayey silt to silty clay
7.00	23.0	12.7	0.175	1.38	0.9	clayey silt to silty clay
7.10	23.3	13.1	0.200	1.53	0.9	clayey silt to silty clay
7.20	23.6	14.4	0.219	1.53	0.9	clayey silt to silty clay
7.30	23.9	15.4	0.252	1.84	0.5	clayey silt to silty clay
7.40	24.3	15.8	0.303	1.52	0.9	clayey silt to silty clay
7.50	24.6	17.4	0.311	1.79	1.0	clayey silt to silty clay
7.60	24.9	18.6	0.349	1.88	1.0	sandy silt to clayey silt
7.70	25.3	21.0	0.371	1.76	1.2	sandy silt to clayey silt
7.80	25.8	20.4	0.472	2.32	1.2	sandy silt to clavey silt
7.90	25,9	23.4	0.457	2.00	1.4	sandy silt to clayey silt
8.00	26.2	23.9	0.551	2.31	1.4	sandy silt to clayey silt
8.10	26.6	23.4	0.523	2.23	1.4	sandy silt to clayey silt
8.20	26.9	23.3	0.558	2.40	1.4	clayey silt to silty clay
8.30	27.2	22.4	0.497	2.22	1.7	clayey silt to silty clay
8.40	27.6	22.4	0.572	2.58	1.7	clayey silt to silty clay
8.50	27.9	23.0	0.552	2.40	2.6	clayey silt to silty clay
8.60	28.2	21.2	0,448	2.11	2.0	clayey silt to silty clay
8.76	28.5	20.2	0.412	2.04	2.0	clayey silt to silty clay
8.80	28.9	17.0	0.445	2.62	2.2	clayey silt to silty clay
8.90	29.2	17.0	0.424	2.43	2.2	clayey silt to silty clay
9.00	29.5	15.3	0.372	2.44	2.2	clayey silt to silty clay
9.10	29.9	12.8	0.280	2.19	2.2	clayey silt to silty clay
9.20	30.2	12.2	0.246	2.02	2.7	clayey silt to silty clay
9.30	30.5	13.0	0.274	2.17	2.7	clayey silt to silty clay
9.40	30.8	12.4	0.263	2.12	2.7	clayey silt to silty clay
J.70	20.0	14.T	0.203	T.17	4.1	croyed arre on arred cital

Soil interpretation reference: Robertson & Campanella-1983, based on 60% hammer efficiency and .2 m sliding data average

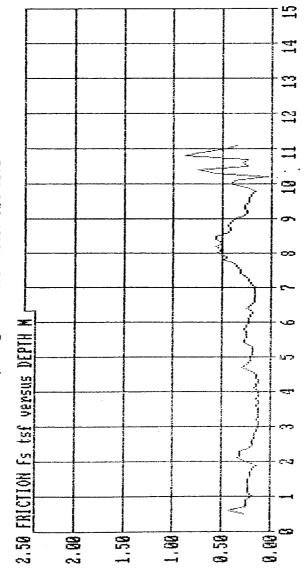
DEPTH meters	DEPTH feet	TIP Oc tsf	FRICTION Fs tsf	FR RATIO	INC I deq	INTERPRETED SOIL TYPE
HC (C1 3	IESE	QC COI	12 (0)	15/40 5	1 009	DOIL TITE
9.50	31.2	12.9	0.236	1.82	2.8	clayey silt to silty clay
9.60	31.5	11.3	0.239	2.11	2.9	clayey silt to silty clay
9.70	31.8	9.8	0.200	2.05	3.0	clayey silt to silty clay
9.80	32.2	9.8	0.175	1.79	3.0	clayey silt to silty clay
9.90	32.5	8.9	0.253	2.84	3.1	silty clay to clay
10,60	32.8	15.1	0.417	2.76	3.1	clayey silt to silty clay
10.19	33.1	13.6	0.373	2.75	3.1	clayey silt to silty clay
16.20	33.5	19.5	0.035	0.16	3.1	sandy silt to clayey silt
10.30	33.8	34.8	0.571	1.64	3.2	sandy silt to clayey silt
10.40	34.1	28.6	0.745	2.81	3.3	sandy silt to clayey silt
16.50	34.4	31,5	0.249	0.78	3.4	sandy silt to clayey silt
16.60	34.8	28.0	0.294	1.05	3.6	silty send to sandy silt
10.70	35.1	33.1	0.243	0.73	3.9	sandy silt to clayey silt
10.80	35.4	26.9	0.871	3.23	3.8	sandy silt to clayey silt
10.90	35.8	48.0	0.717	1.49	4.0	sandy silt to clayey silt
11.00	38.1	34.7	0.460	1.32	3.9	silty sand to sandy silt
11.10	36.4	52.7	0.359	0.68	4.7	?
11.20	36.7	139.3	?	?	4.2	?

Soil interpretation reference: Robertson & Camponella-1983, based on 60% hammer efficiency and .2 m sliding data average

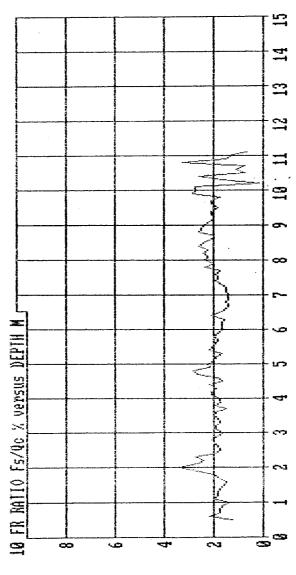
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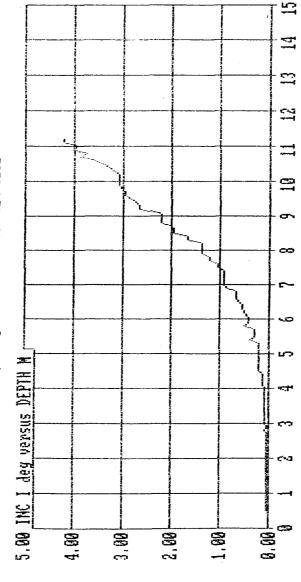
SOUNDING DATA IN FILE SHD109 06-30-94 20:07
OPERATOR: S.UAN
CLIENT: WES
JOB No.: DACH39-94-M-5062



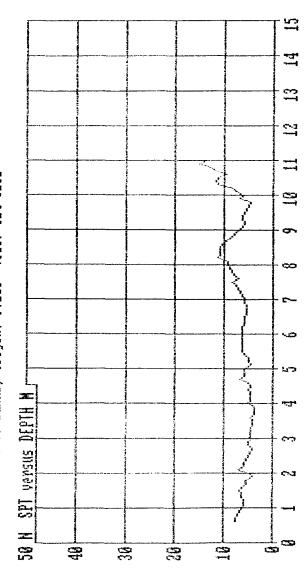
SOUNDING DATA IN FILE SHDIRD G6-38-94 28:87
OPENATOR: S.UAN
CLIENT: WES JOB No.: DACU39-94-M-5862



SOUNDING DATA IN FILE SND109 86-38-94 20:07
OPERATOR: S.UAN
LOCATION: P-12/BFC-KC-MO
CLIENT: WES
JOB No. : DACU39-94-M-5862



SOUNDING DATA IN FILE SND109 86-30-94 20:07 OPERATOR: S.UAN CLIENT: WES JOB No. : DACH39-94-M-5062



SCPT P-13

vandeney Soil Expl

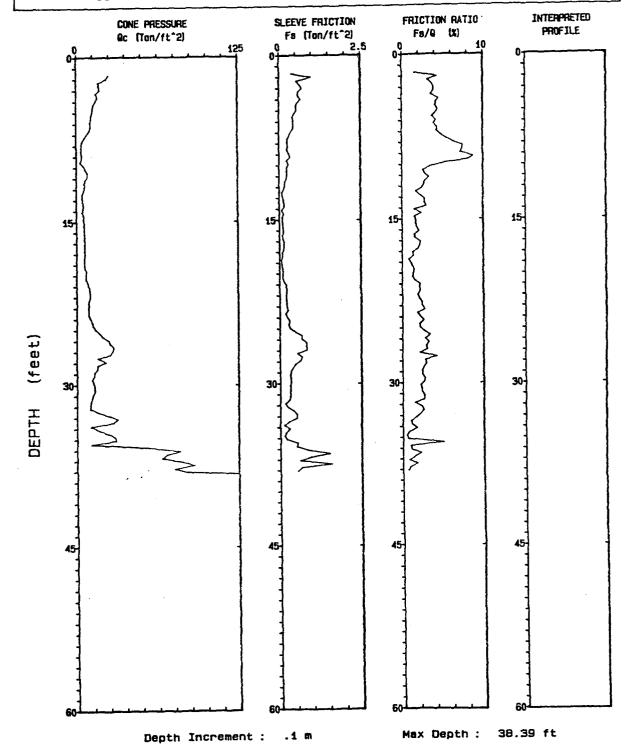
Operator : S.VAN

Sounding: SND110 Pg 1 / 1

Client: WES

CPT Date: 06-30-94 21:30 Location: P-13/BFC-KC MO

Jab No. : DACW39-94-M-5062



SOUNDING DATA IN FILE SND110 06-30-94 21:30

OPERATOR : S.UAN

LOCATION : P-13/BFC-KC MO

CLIENT : WES

JOB No. : DACW39-94-M-5062

Vandehey Soil Exploration

40695 Nw Facific Ave. Banks, Oregon. 97106 (503) 324 3261

				FF. D. T.	<b></b>	**************************************
DEPTH	DEPTH	TIP		FR RATIO	INC	INTERPRETED
meters	feet	Qo tef	Fs tsf	Fs/Qc ≇	I deg	SOIL TYFE
0.50	1.6	24.9	0.391	1.57	0.1	7
0.60	2.0	23.1	0.990	4.29	0.0	clayey silt to silty clay
0.70	2.3	17.3	0.547	3.16	0.0	silty clay to clay
0.80	2.6	17.3	0.541	3.70	0.0	silty clay to clay
0.90	3.0	18.3	0.711	3.89	0.0	silty clay to clay
1.00	3.3	15.1	0.580	3.84	0.0	silty clay to clay
1.10	3.5	16.5	0.581	3.52	0.0	silty clay to clay
1.20	3.9	15.1	0.682	4.53	0.0	clay
1.30	4.3	13.2	0.551	9.17	0.0	clay
1.40	4.8	12.6	0.516	4.08	0.0	clay
1.50	4.9	12.3	0.537	4.38	0.0	ciay
1.60	5.2	11.5	0.471	4.12	0.0	clay
1.70	5.€	11.2	0.419	3.73	0.0	clay
1.80	5,9	10.6	0.442	4.18	0.0	clay
1.90	6.2	11.1	0.432	3.89	0.0	clay
2.00	8.8	10.0	0.435	4.34	0.0	clay
2.10	6.9	B.4	0.363	4.32	0.0	clay
2.20	7.2	€.3	0.304	4.84	0.0	clay
2.39	7.5	4.6	0.249	5.40	0.0	clay
2.40	7.9	3.8	0.243	6.36	0.0	clay
2.50	8.2	3.6	0.272	7.49	0.0	organic material
2.60	8.5	3.2	0.242	7.51	0.0	organic material
2.70	8.9	4.0	0.290	7.19	0.0	organic material
2.80	9.2	3.8	0.334	8,79	0.0	organic material
2.90	9.5	2.7	0.220	8,09	0.0	organic material
3.00	9.₽	5.5	0.281	5.01	0.0	clay
3.10	10.2	8.9	0.236	3,43	0.1	clay
3.20	10.5	8.6	0.219	2,55	0.1	silty clay to clay
3,30	10.8	8.5	0.237	2.81	0.1	silty clay to clay
3.40	11.2	6.5	0.214	3.28	0.1	clay
3.50	11.5	5.9	0.162	2.74	0.1	clay
3.60	11.8	6.2	0.166	2.67	0.1	clay
3.70	12.1	5.5	0.128	2.35	0.1	silty clay to clay
3.80	12.5	4.2	0.069	1.63	0.1	silty clay to clay
3.90	12.8	4.3	0.095	2.22	0.1	clay
4.00	13.1	4.7	0.130	2.78	0.1	clay
4.10	13.5	5.4	0.151	2.80	0.1	clay
4.20	13.8	5.1	0.148	2.93	0.1	clay
4.30	14.1	4.0	0.060	1.49	0.1	silty clay to clay
4.40	14.4	5.5	0.126	2.31	0.1	silty clay to clay

Soil interpretation reference: Robertson & Campanella-1983, based on 60% hammer efficiency and .2 \* sliding data average

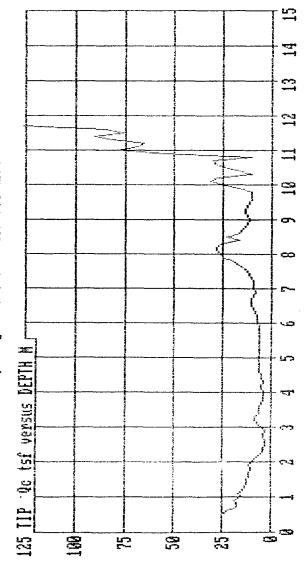
OFRIU	DEPTH	TIP	FRICTION	FR RATIO	INC	INTERPRETED
	feet	Qc tsf	Fs tsf	Fs/Qc 2	I deg	SOIL TYPE
meters	1661	ųc tsi	F5 151	15/QC 4	1 059	OUL THE
4.50	14.8	5.6	0.084	1.50	0.1	silty clay to clay
4.60	15.1	5.9	0.100	1.70	6.1	sensitive fine grained
4.70	15.4	5.8	0.095	1.65	0.1	silty clay to clay
4.80	15.7	5.9	0.102	1.75	0.1	silty clay to clay
4.90	16.1	6.1	0.124	2.03	6.1	silty clay to clay
5.00	15.4	6.0	0.089	1.48	0.1	silty clay to clay
5.10	18.7	6.4	0.100	1.57	0.1	silty clay to clay
5.20	17.1	6.4	0.147	2.22	û.1	silty clay to clay
5.30	17.4	6.0	0.126	2.10	0.1	silty clay to clay
5.40	17.7	6.2	0.117	1.99	0.1	silty clay to clay
E.50	18.0	6.3	0.082	1.29	0.1	sensitive fine grained
5.60	18.4	5.5	0.079	1.35	0.1	sensitive fine grained
5.70	18.7	5.9	0.045	0.76	0.1	sensitive fine grained
5.80	19.0	6.0	0.064	1.07	0.1	sensitive fine grained
5.90	19.4	6.5	0.081	1.25	0.1	sensitive fine grained
6.00	19.7	7.5	0.113	1.50	0.1	clayey silt to silty clay
6.10	20.0	7.2	0.091	1.28	0.1	clayey silt to silty clay
6.20	20.3	7.2	0.089	1.24	0.1	clayey silt to silty clay
6.30	20.7	8.7	0.134	1.54	0.1	clayey silt to silty clay
6.40	21.0	9.3	0.204	2.20	0.0	clayey silt to silty clay
6.50	21.3	10.3	0.220	2.13	0.0	clayey silt to silty clay
6.60	21.7	10.1	0.217	2.16	0.0	clayey silt to silty clay
6.70	22.0	10.7	0.187	1.83	0.0	clayey silt to silty clay
6.80	22.3	9.3	0.194	2.08	0.0	clayey silt to silty clay
6.90	22.6	8.8	0.210	2.39	0.0	silty clay to clay
7.00	23.0	8.9	0.217	2.44	0.0	silty clay to clay
7.10	23.3	9.2	0.247	2.69	0.0	silty clay to clay
7.20	23.6	9.2	0.165	1.79	0.0	clayey silt to silty clay
7.30	23.9	10.6	0.231	2.18	0.0	clayey silt to silty clay
7.40	24.3	11.6	0.303	2.62	0.0	clayey silt to silty clay
7.50	24.6	12.7	0.261	2.06	0.0	clayey silt to silty clay
7.50	24.9	14.5	0.313	2.15	0.0	clayey silt to silty clay
7.70	25.3	17.6	0.471	2.68	0.0	clayey silt to silty clay
7.80	25.8	20.2	0.685	3.39	0.0	clayey silt to silty clay
7.90	25.9	24.6	0.690	2.80	0.0	clayey silt to silty clay
8.00	26.2	25.8	0.827	3.21	0.0	clayey silt to silty clay
8.10	26.6	28.6	0.820	2.87	0.0	clayey silt to silty clay
8.20	26.9	27.9	0.840	3.01	0:0	clayey silt to silty clay
8.30	27.2	25.7	0.536	2.09	0.0	clayey silt to silty clay
8.40	27.6	16.4	0.694	4.24	0.0	clayey silt to silty clay
8.50	27.9	22.5	0.624	2.78	0.0	clayey silt to silty clay
8.60	28.2	16.7	0.471	2.90	6.0	clayey silt to silty clay
8.70	28.5	15.6	0.395	2.54	0.0	clayey silt to silty clay
8.80	28.9	13.4	6.318	2.38	0.0	clayey silt to silty clay
8.90	29.2	12.9	0.309	2.39	0.0	clayey silt to silty clay
9.00	29.5	11.5	0.311	2.71	0.0	clayey silt to silty clay
9.10	29.9	12.9	0.332	2.58	0.0	clayey silt to silty clay
9.20	30.2	13.7	0.297	2.16	0.0	clayey silt to silty clay
9.30	30.5	13.7	0.317	2.32	0.0	clayey silt to silty clay
9.40	30.8	12.4	0.297	2.40	0.0	clayey silt to silty clay
31.10						

Soil interpretation reference: Robertson & Campanella-1983, based on 60% hammer efficiency and .2 m sliding data average

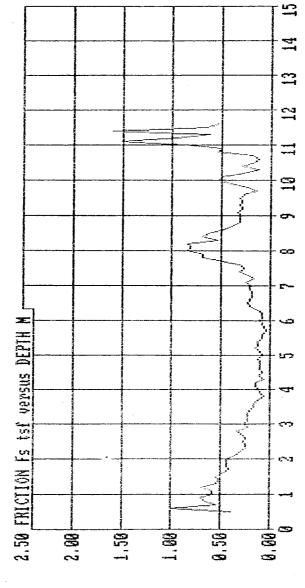
DEPTH meters		TIF Qc tsf	FRICTION Fs tsf	FR RATIO Fs/Qc ≱	ING I deg	INTERPRETED SOIL TYPE
9.50	31.2	11.5	0.307	2.68	0.0	silty clay to clay
9.60	31.5	10.6	0.271	2.56	0.0	clayey silt to silty clay
9.70	31.8	10.1	0.153	1.51	0.0	clayey silt to silty clay
9.80	32.2	9.9	0.235	2.37	0.0	clayey silt to silty clay
9.90	32.5	16.1	0.411	2.54	0.0	clayey silt to silty clay
10.00	32.8	24.6	0.517	2.10	0.0	sandy silt to clayey silt
10.10	33.1	31.4	0.506	1.61	0.0	sandy silt to clayey silt
10.20	33.5	27.7	0.263	0.95	0.1	sandy silt to clayey silt
10.30	33.8	10.6	0.12E	1.19	0.1	sandy silt to clayey silt
10.40	34.1	16.5	6.287	1.74	0.1	sandy silt to clayey silt
10.50	34.4	24.2	0.174	0.72	0.1	sandy silt to clayey silt
10.50	34.8	25.1	0.124	0.43	0.1	silty sand to sandy silt
10.70	35.1	29.9	0.193	0.65	0.2	sandy silt to clayey silt
10.80	35.4	10.8	0.539	4.99	0.2	sandy silt to clayey silt
10.90	35.8	55.3	0.510	0.92	0.4	silty sand to sandy silt
11.00	3E.1	79.6	0.867	1.09	0.3	silty sand to sandy silt
11.10	36.4	69.2	1.530	2.21	0.4	silty sand to sandy silt
11.20	36.7	65.7	0.946	1.44	0.3	silty sand to sandy silt
11.30	37.1	81.3	818.0	0.76	0.4	sand to silty sand
11.40	37.4	90.7	1.594	1.7€	0.8	silty sand to sandy silt
11.50	37.7	75.9	0.656	0.86	0.9	sand to silty sand
11.60	38.1	85.4	0.541	0.€3	1.0	?
11.70	38.4	174.7	?	?	1.0	?

Soil interpretation reference: Robertson & Campanella-1983, based on 60% hammer efficiency and .2 m sliding data average

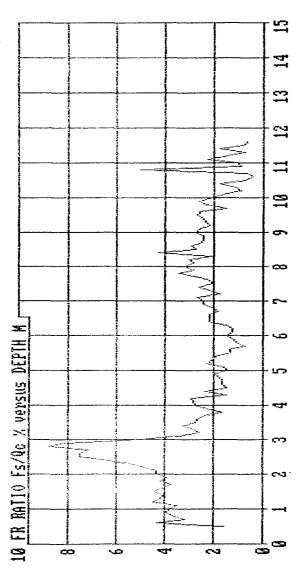
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LOCATION: P-13/BFC-KC MO
CLIENT: WES
JOB No.: DACW39-94-M-5862



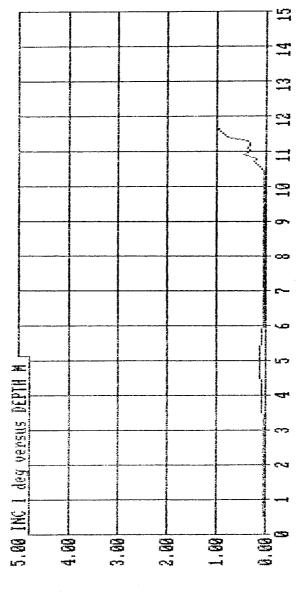
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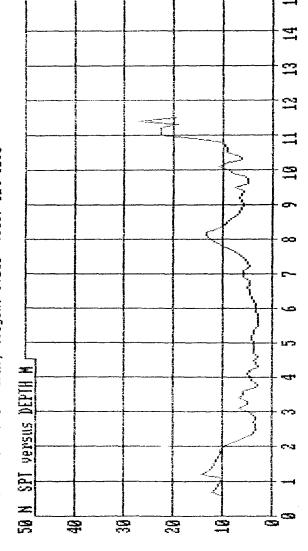
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CLIENT: WES
JOB No.: DACW39-94-M-5062



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OPERATOR: S.UAN
CLIENT: WES
JOB No.: DACK39-94-M-5062



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CLIENT: WES
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An in situ geophysical inv	vestio	ration consisting of cro	sshole and down	hole shear w	ave (S-wave) seismic		
cone penetrometer tests (SCP)	-	_					
City, Missouri. The SCPT wa							
characterizing the soils at the	site.	The results of the SCI	T were used to p	rovide a con	tinuous prediction of		
soil type and N-values. The m	main p	purpose of the investig	ation was to dete	rmine the S-	wave velocities of the		
soil and bedrock in the vicinit							
dynamic analysis of the buildi	_		•	namic analys	is will be used to		
determine if any building desi	_	-					
The S-wave velocities me							
agreed very well. The S-wave		•		•	_		
and 775 fps. A 1- to 5-ft. thick basal clay-gravel, which overlies bedrock, showed a velocity of approximately 1,100 fps. The Pleasonton Group bedrock found at the site is a hard shaly siltstone and is encountered at a							
depth of approximately 40 ft. measured using the crosshole			s-wave velocity of	or approxima	tely 1,900 lps and was		
measured using the crossione	J-wa	ive memou.					
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Bannister Federal Complex Crosshole Geophysics

Pleasonton Group Seismic Cone Penetrometer Test Shear waves